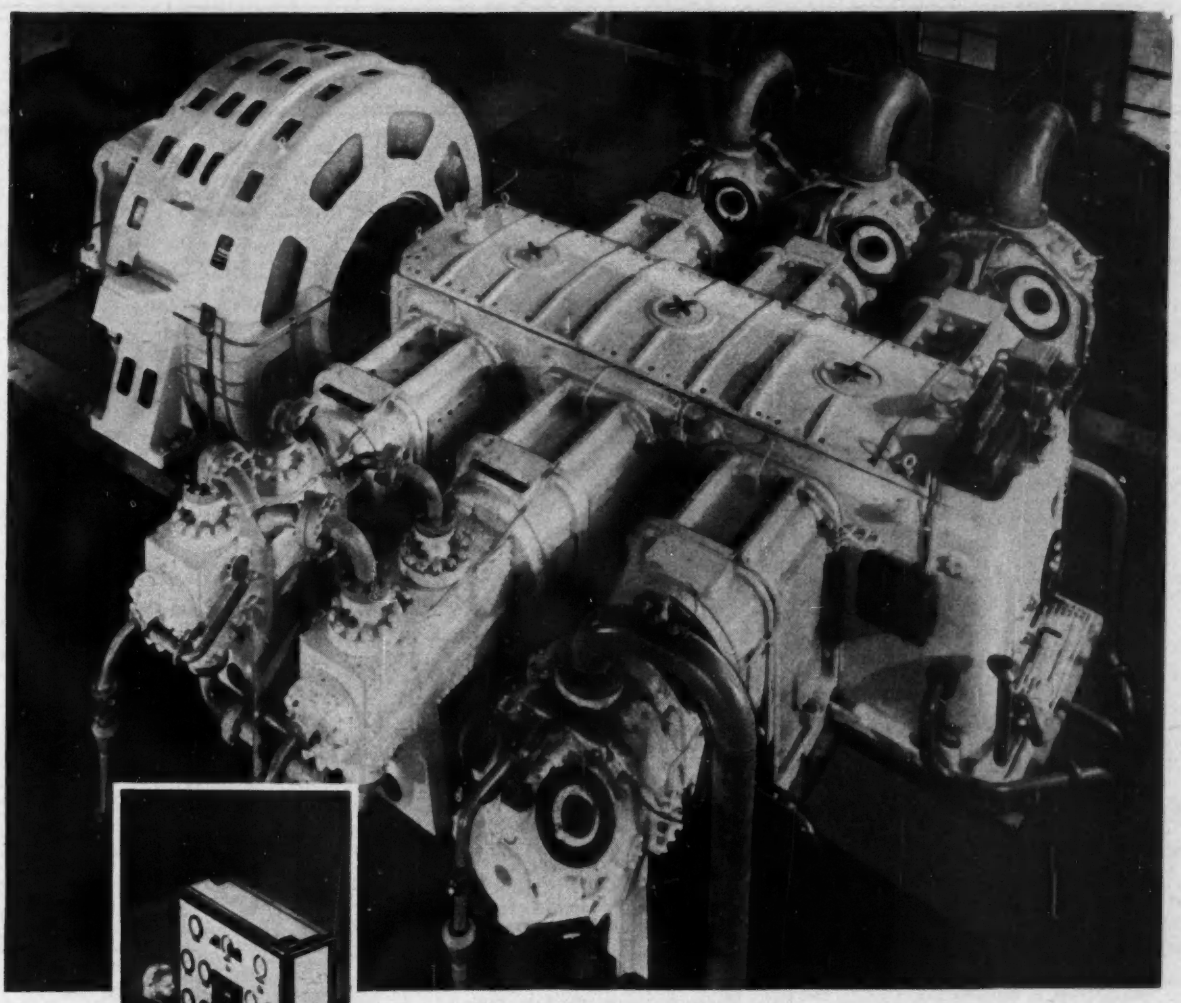
Chemical Age

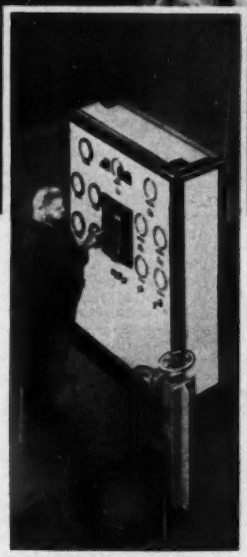
FIRST U.K. GAS DEHYDRATION PLANT
(page 759)

VOL. 83 No. 2130

7 May 1960

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY





COMPRESSORS FOR INDUSTRY

One of a number of Brotherhood six crank five stage compressors supplied to The British Oxygen Company Ltd. Each compressor has a capacity of 8,670 m³/hour, delivery pressure 185 atmospheres, driven by 3,050 H.P. synchronous motor.

Brotherhood compressors are designed to customers' exact requirements.

PETER BROTHERHOOD LTD.

PETERBOROUGH ENGLAND

Compressor and power plant specialists for nearly a century

P.3629

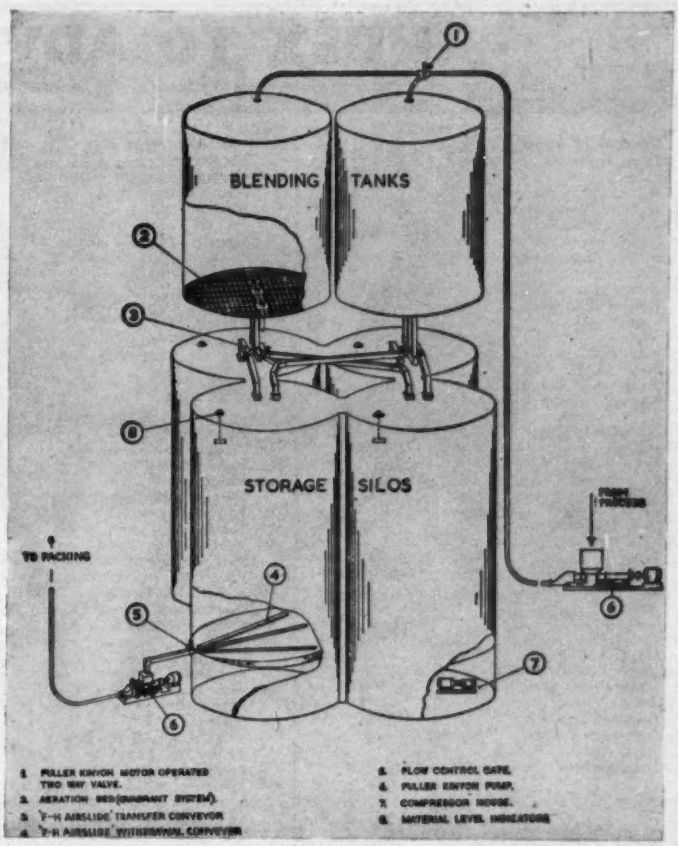
INDEX TO ADVERTISERS

The first figures refer to advertisements in **Chemical Age Directory & Who's Who,** *the second to the current issue*

(*Continued on page 740*)

FULLER AIRMERGE SYSTEM

AERATION BLENDING AT FULL MATURITY



The Airmerge System has demonstrated these advantages for all who have to handle mixed powdered materials. (1) Thorough homogenization even when the blended materials differ in bulk density and fineness. (2) High capacity in tonnage through-put in a silo of moderate size. (3) High capacity in tons per hour means a saving in man-hours per ton. (4) Unequalled economy in k.w.h. per ton of blended product. (5) No other known process does an equal job in blending large volumes of dry material. (6) This system is ideally suited for use in either batch or continuous operations.

HOMOGENIZATION IS THE END RESULT

To ensure the perfect performance of an Airmerge installation, Constantin (Engineers) Ltd. are prepared with a fully equipped laboratory to test all materials submitted, to determine their fluidizing characteristics, and to provide the basic data necessary for designing an effective assembly of blending equipment.

FULLER PLANT for the Chemical Industry also includes Fuller-Kinyon Pumps, *"F-H. Airslide" Fluidizing Conveyors, Grate Coolers, Rotary Gate Valves, Material Level Indicators, Remote Control Panels, etc., details of which are available on request.

Send your enquiries to:—

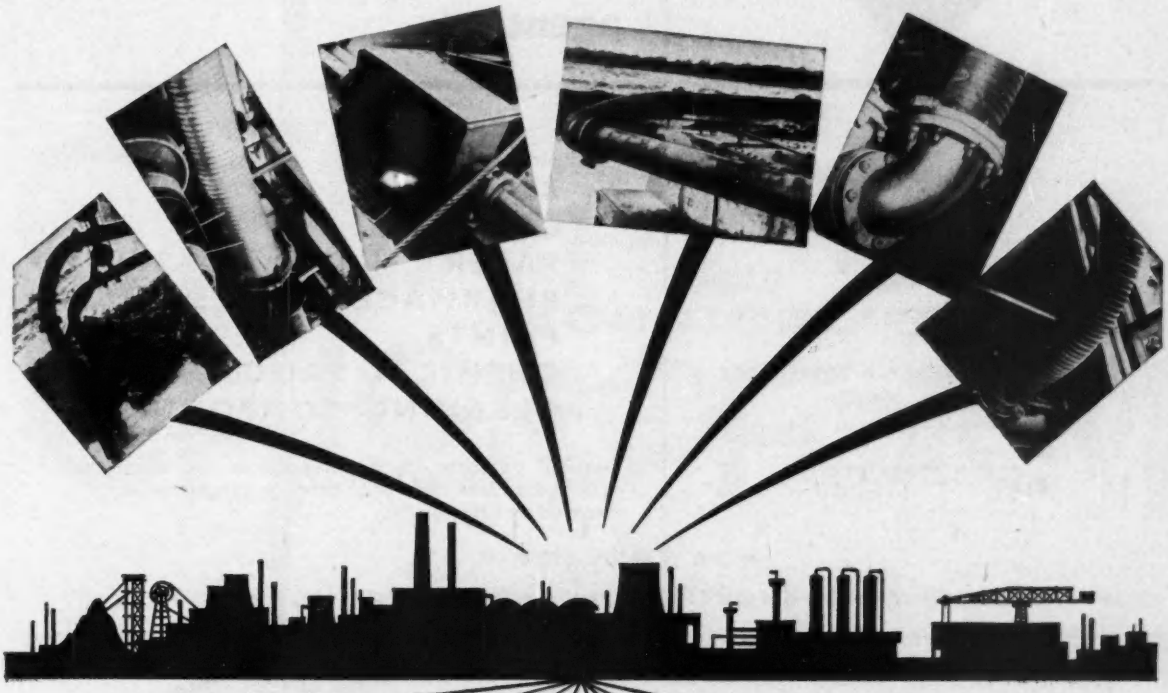
CONSTANTIN (ENGINEERS) LTD.
123 VICTORIA ST., LONDON, S.W.1. Tel: TATE GALLERY 0637
(Sole licensees for the manufacture and sale of Fuller equipment in Great Britain)

* REG. TRADE MARK

INDEX TO ADVERTISERS

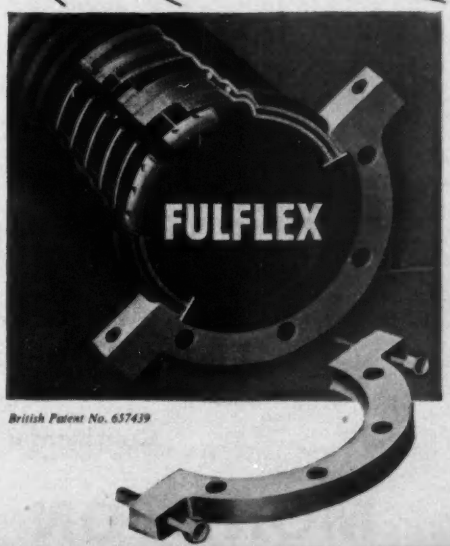
The first figures refer to advertisements in **Chemical Age Directory & Who's Who,** *the second to the current issue*

Fulflex FLANGED RUBBER HOSES



- BTR FULFLEX is supplied in Natural or Synthetic Rubbers.
- BTR FULFLEX is used for abrasion or corrosion applications, for foodstuffs, beverages, oils, chemicals, sand, slurries, grain etc.
- BTR FULFLEX permits maximum flexibility in shorter lengths. No wasted spigot stiffness; no tailpiece to wear or damage the liner.
- BTR FULFLEX hoses have rubber bore throughout. No coupling corrosion. Full unrestricted flow.
- BTR FULFLEX flanges are positive fitting, ensure bore alignment with unskilled labour, and permit rotation of the hose to even wear.
- BTR FULFLEX flanged hoses are being supplied for vacuum or pressure in sizes 1" to 16" i.d. and from 10" to 20 ft. overall length.

Incorporate BTR FULFLEX FLANGED HOSES in your pipeline design. They eliminate vibration and obviate closure pieces in offset pipework.



British Patent No. 657439

BTR

BTR Industries Ltd

HOSE DIVISION

VINCENT HOUSE, VINCENT SQUARE, LONDON, S.W.1

TELEPHONE: VICTORIA 9807-8-9

CHEAPER TECHNICAL GRADE CHLOROFORM

I.C.I. has made substantial price reductions for technical grade chloroform

A SOLVENT FOR:

- —extraction of penicillin and other pharmaceutical products
- —oils, fats, resins, lacquers
- —cellulose acetate, polyvinyl acetate, benzoyl cellulose, cellulose acetate-butyrate, and polystyrene
- —bonding of plastics
- —manufacture of dyestuffs intermediates and fine chemicals

TYPICAL CHARACTERISTICS

Non-inflammable		
Clear and colourless		
Free halogens		not detected
Specific gravity at 15.5/15.5°C		1.502
Distillation range (5—95%)		0.3°C
Residue on evaporation at 110°C	%	<0.001
Moisture H_2O	%	0.023
Acidity as HCl	%	0.0001

DELIVERY IN BULK AND IN DRUMS

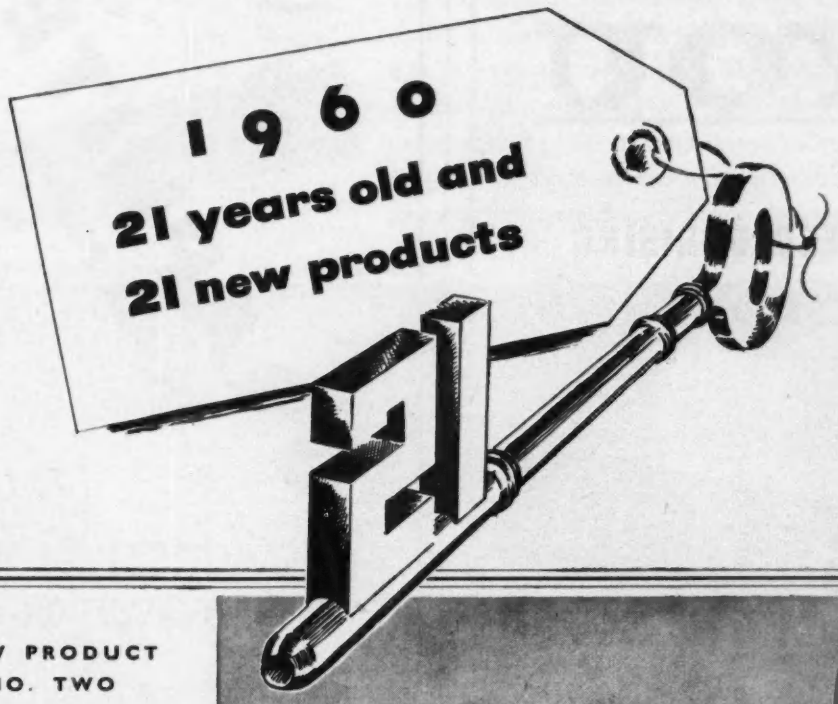
For further information, please consult—

IMPERIAL CHEMICAL INDUSTRIES LIMITED
LONDON S.W.1

ICI
GENERAL CHEMICALS DIVISION

GC.13a

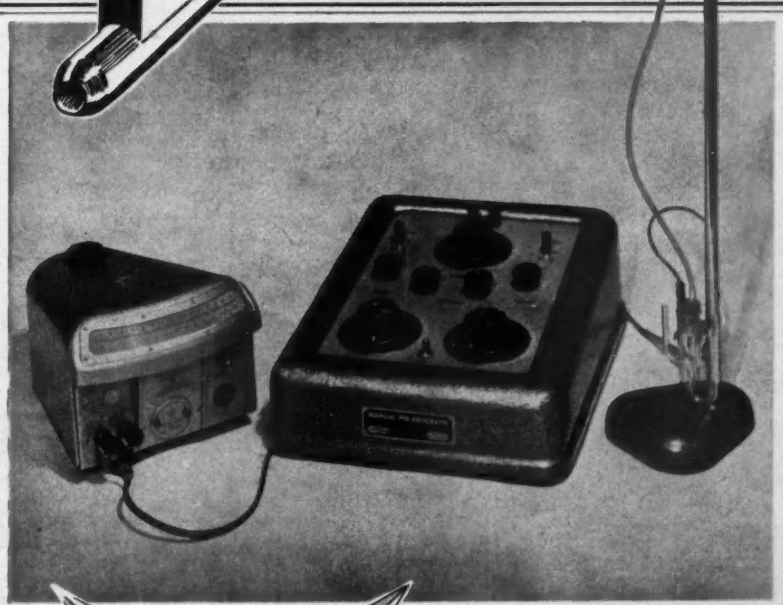
Two of Twenty-one



NEW PRODUCT NO. TWO

The manual Polarograph A1650 is designed to achieve a speed of operation equal to that of recording instruments.

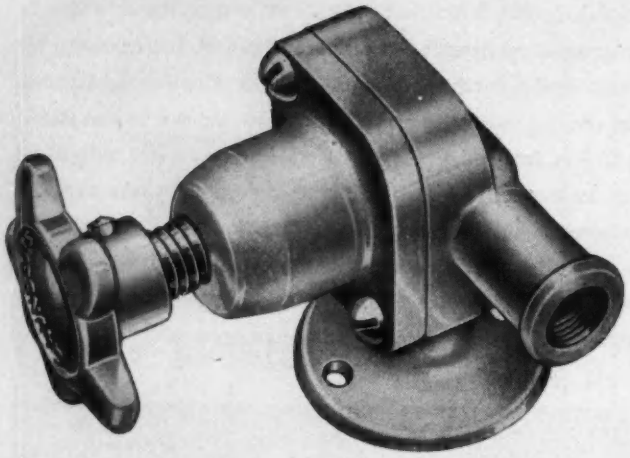
Positive "click stop" voltage change by exact increments leaves the operator free to observe **current** changes only, thus making analyses extremely accurate and rapid. Determinations may be repeated under identical conditions, without precise adjustment and without fatigue.



SOUTHERN
Instruments

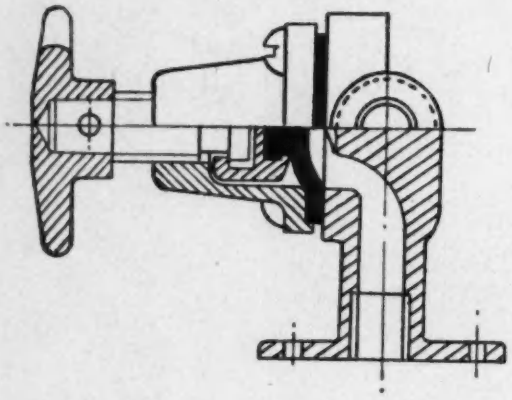
AN ADVERTISEMENT OF SOUTHERN INSTRUMENTS LIMITED CAMBERLEY SURREY. CAMBERLEY 3401

B

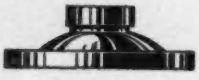


DIFFERENT

- - - to provide laboratories with the immaculate control needed for vital research.



Wherever the smaller pipelines need the same sure closure and isolation of mechanism from the fluid under control, as are provided with the larger Saunders Valves, these N.L. Types should be specified.



DIAPHRAGMS

IN MANY GRADES,

readily changed to suit different duties and available in reinforced form for use on vacuum services.

SAUNDERS DIAPHRAGM VALVES

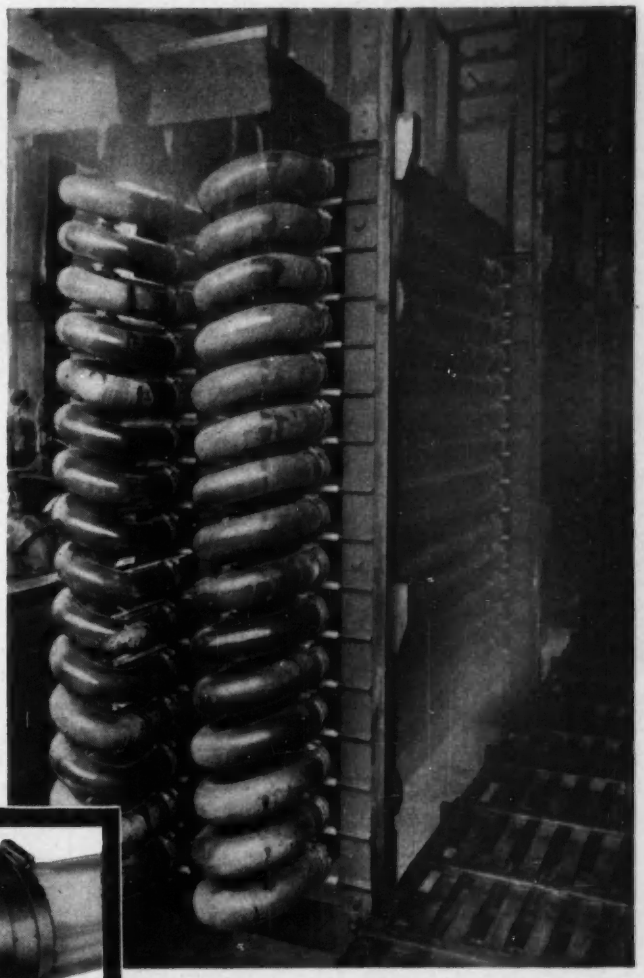
SAUNDERS VALVE COMPANY LIMITED

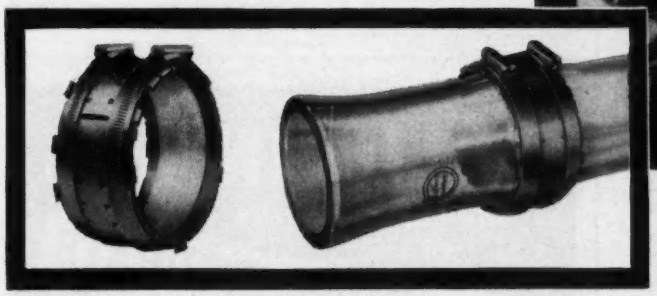
DIAPHRAGM VALVE DIVISION

CWMBRAN NEWPORT MONMOUTHSHIRE Telephone CWMBRAN 3081

QUICKFIT *Visible Flow*

SULPHURIC ACID COOLERS IN GLASS





Photographs by courtesy of SCOTTISH AGRICULTURAL INDUSTRIES LTD

Q.V.F. Glass Cascade Coolers are being used with marked success because they resist attack by Sulphuric Acid in all concentrations and at all temperatures and equally the mixtures of this acid with oxides of nitrogen common in many processes.

The problem of pipe jointing has been successfully overcome by a new type moulded elastomer sleeve with worm drive clips backed by a stainless steel gaiter patented by Scottish Agricultural Industries Ltd. This new coupling permits flexibility in assembly; avoids undue stresses; is free from leakage; allows closer pitching of cooler tubes and resists cooling water and atmospheric corrosion.

Fully descriptive folder on application

Q·V·F·
LIMITED
The Chemical Engineers in Glass

DUKE STREET · FENTON · STOKE-ON-TRENT
STAFFORDSHIRE

TEL.: LONGTON, STAFF 32104-8
'GRAMS: Q.V.F., STOKE-ON-TRENT, TELEX

10 SD plants in 5 countries will produce 130,000,000 lbs. of maleic anhydride — more than half the world's capacity

HEYDEN NEWPORT CHEMICAL CORPORATION
Fords, New Jersey

EUROPEAN PLANT

AMERICAN CYANAMID COMPANY
Bridgeville, Pennsylvania

SCIENTIFIC DESIGN is the recognized leader in

MALEIC ANHYDRIDE

COMPLETE PLANT DESIGN • CATALYST MANUFACTURE

Other SD Maleic Anhydride Projects

• **PITTSBURGH COKE & CHEMICAL COMPANY,** Neville Island, Pennsylvania • **MONSANTO CHEMICAL COMPANY,** St. Louis, Missouri • **MONSANTO CANADA LIMITED,** Ville La Salle, Montreal • **REICHHOLD CHEMICALS, INC.,** Elizabeth, N. J. • **MONSANTO CHEMICALS LIMITED,** Newport, Monmouthshire, England • **COMPAGNIE FRANCAISE DES MATIERES COLORANTES,** Villers-St. Paul, France • **FTALITAL S.p.A.,** Scanzorosciate, Italy

SD's Process Offers

- **substantially increased yield**
- **longer catalyst life**
- **exceptionally high product purity**
- **guaranteed operability**

Coming Soon—SD's NEW FUMARIC ACID PROCESS

SCIENTIFIC DESIGN COMPANY, INC.

EXECUTIVE OFFICES: TWO PARK AVENUE, NEW YORK 16, NEW YORK

THE SD GROUP:

SD Plants Inc., New York • SD Plants, Canada Ltd., Toronto
SD Plants Ltd., London, England • Catalyst Development Corporation, New Jersey
Société Francaise des Services Techniques S.a.r.l., Paris, France

VOL. 83 No. 2130
MAY 7 1960

Telephone: FLEet Street 3212 (26 lines)
Telegrams: Benformula-Cent-London

Editor M. C. HYDE
Manager R. C. BENNETT
Director N. B. LIVINGSTONE WALLACE

Midland Office
Daimler House, Paradise Street, Birmingham. [*Midland* 0784-5]

Leeds Office
Permanent House, The Headrow, Leeds 1. [*Leeds* 22601]

Scottish Office
116 Hope Street, Glasgow C2. [*Central* 3954-5]

CHEMICAL AGE

BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4

IN THIS ISSUE

Annual subscription is: home, 52s 6d, overseas, 60s, single copies 1s 6d (by post 1s 9d)

U.S. CHEMICAL PROJECT

IN the light of the recently announced U.K. chemical industry's expansion plans, it is of interest to consider the U.S. situation. A recent joint survey by the U.S. Department of Commerce and the Securities and Exchange Commission (*Chemical and Engineering News*, 1960, **38**, Nos. 11 and 12), shows that capital expenditure for chemicals and allied products in the U.S. should reach $1,642 million this year—33% more than last year and less than $100 million under the industry's record expansion year in 1957.

Capital outlays in chemicals and allied products are expected to reach $676 million during the first half of 1960. For the final three months of 1959, expenditure is put at $363 million and at $318 million for the first quarter of 1960.

At the end of 1959, U.S. construction companies appeared to be concerned with amended or held-over chemical construction plans. A recent survey by the U.S. Manufacturing Chemists' Association indicates, however, that for the period 1960-1961, chemical construction expenditure is estimated at $1,660 million—$143 million higher than in 1959-60. Of this sum $1,170 million will be for projects already under construction; the remainder will be for projects due to be started in 1960 and completed before 1962.

U.S. chemical industry last year completed $1,340 million worth of construction bringing the total for 1959-61 to $3,000 million or $291 million below the 1958-1960 period and $838 million below the 1957-1959 period.

The fall in completed construction in 1959 compared with the 1958 figure is due partly to construction setbacks in the 1958 recession. This year the outlook is very much more encouraging with U.S. chemical companies planning to build more plants in a greater number of areas. The M.C.A. survey indicates that 87 companies plan to spend $485.5 million on 151 projects in 126 areas of 34 states. This compares with 58 companies plans to allocate $64 million for 88 projects in 73 communities of 25 states in 1959. As in the U.K., considerable expenditure is planned for construction of new laboratory facilities—$220.5 million as against $157.2 million for the 1958-1960 period and $107.2 million for the 1957-1959 period.

Main areas attracting chemical construction in the U.S. are the West South Central states (Texas, Louisiana, Oklahoma and Arkansas) with projects totalling $1,200 million followed by the East South Central States ($349.7 million), South Atlantic states ($334.8 million), and East North Central States ($329.2 million). Projects for the Middle Atlantic states for 1959-1961 total 158. Of the most popular states, Texas heads the list with chemical construction projects valued at $792.5 million.

Inorganic chemicals projects are in the lead in the U.S. for the period 1959-1961 with a total outlay of $686.2 million. In second place are plants for general organic chemicals at $674.5 million, although both these categories are down when compared with the 1958-1960 figures of $797.2 million and $801.4 million respectively. Petrochemicals and plastics

and resins projects follow with outlays of $454.5 million and $450.0 million respectively. Further down the list are laboratories ($220.4 million), fertiliser chemicals ($116.4 million), synthetic fibres ($101.3 million), metals ($85.9 million), synthetic rubber ($45.150 million), and miscellaneous ($167.0 million).

Production of U.S. plastics and resin producers has already been a record—up 25% on last year's output. Capacity is adequate to meet the growing demand while expansion of facilities is announced weekly by various U.S. plastics producers. Some overcapacity still exists, notably in low-pressure polythene and, although some time ago it was suggested that a nitrogen and fertiliser chemical overcapacity problem existed, this appears to have been overcome or to be localised in certain U.S. states for at least three large U.S. companies in the last few days have announced expansion plans for ammonia production (see CHEMICAL AGE, 12 March, p. 457).

CANADIAN EXPANSION

ACCORDING to a Government survey 70% of all Canadian petrochemical plants are sited in Alberta and produce 25% of Canada's chemicals. In 1957, it was estimated that Alberta plants would produce 50% or more of Canadian chemicals by 1967.

The petrochemical industry, which results from the large increase in production of crude oil and natural gas of the Alberta petroleum fields, today represents an investment of more than $225 million. The plants centred at Edmonton, Calgary and Southern Alberta manufacture major materials used in a wide range of products from cosmetics and insecticides, brake fluid and tyres, food colouring and carpets, textiles and newspapers.

The industry gained a foothold in Alberta in about 1940 when the Federal Government set up an ammonia plant at Calgary to produce chemicals used in explosives. The plant was taken over by Consolidated Mining and Smelting Co. of Canada and as recently as eight years ago was the only large chemical plant in Alberta. Major expansion in the industry really began following discovery of Leduc Oil field in 1947.

In January 1957, a $4 million British American Oil Co. plant harnessed the reserves in Canada's largest wet gas field, Pincher Creek, and now represents a $25 million investment. Production next year at this plant is estimated at 700 tons of sulphur 43,000 gall. of propanes, 43,000 gall. of butane and 6,500 gall. of condensate natural gas daily.

A sulphur extraction plant at Jumping Pound, west of Calgary, built by Shell Oil Co. is valued at $5 million and is capable of producing 80 tons of sulphur daily. Another extraction plant built by Royalite Oil Co., at Turner Valley is valued at $4 million and produces propane, sulphur, gasoline and purified natural gas. A $3 million Imperial Oil Company plant at Redwater produces liquid hydrocarbons and 10 tons of sulphur a day.

A group of six companies last year joined to start construction on a $3 million processing plant in the Stettler-Nevis area capable of producing 40 million cu. ft. of natural gas a day. At midsummer last year a $9 million sulphur extraction plant at Okotoks was producing up to 30 million cu. ft. of gas daily and extracting 370 long tons of sulphur.

During the last 14 years in the Edmonton area alone, 95 new plants have been established. Many are petrochemical plants dependent on oil, natural gas and their by-products.

Canadian Chemical Company built a $75 million plant on the banks of the North Saskatchewan River. Today the plant, the largest in Western Canada, exports 95% of production to Eastern Canada. Its products include synthetic textiles, cellulose, acetate flake, acetic acid, acetone, butyl-alcohol, propylene-glycol, dipropylene glycol, isobutanolmethyl ethyl ketone, pentaerythritol and formaldehyde.

All this development is relevant to the current belief of many Canadian chemical industrialists that the industry has grown too fast for its economic good. Coupled with growing import competition, this is why a Canadian tariff inquiry will this year consider the industry's call for tariff protection to tide it over until market demands can absorb the rapidly growing output.

Canadian chemical producers generally are also giving serious consideration to see if current expansion plans should in their own interests be held back for the time being.

The inquiry began on 2 May and the board will probably need about two years to complete their review. It has been pointed out that the industry's profits on sales of $1,200 million in 1958 were 5% and 4.5% on assets of $1,300 million. The 1959 return on sales of $1,400 million is estimated at 4.5% with 3.6% on assets of $1,700 million. The U.K. chemical industry is expected to earn about 8% on both sales and assets, and the U.S. industry 9.1% on sales and 11% on assets.

The Canadian chemical industry believes that once turnover volume is achieved, profits on both sales and investments will compare more favourably with the U.K. and the U.S. Until tariffs are revised upwards, however, volume will be limited by imports.

U.S. STYRENE PRODUCTION

REFERENCE was made recently to new styrene plant projects in the U.S. Behind these plans for increased capacity, totalling some 40%, are the growing sales of styrene monomer. Last year output of polystyrene and other styrene resins rose 20% in 1959 to total about 920 million lb. This year output is expected to reach 1,000 million lb. and with the new expansions already announced a 40% increase in U.S. capacity will be added by 1962 to reach 2,000 million lb. (*Chem. and Engng. News*, 1960, **38**, No. 8, 30).

Since the end of last year six major U.S. producers have announced styrene expansion plans. Dow Chemical, major U.S. producers, are to raise annual capacity to 800 lb. or more by 1961. They already have a capacity of 550 million lb. Sinclair-Koppers Chemical, recently formed by Sinclair and Koppers (CHEMICAL AGE, 20 February, p. 329) are to build a plant at Houston, Texas, having a capacity of 70 million lb. a year, and Cosden Petroleum, using the Alkar process will set up a new plant at Big Spring Texas, with a capacity of 40 million lb. a year. Thus is due on stream early in 1961. Present capacity is 20 million lb. a year using superfractionation of aromatic streams.

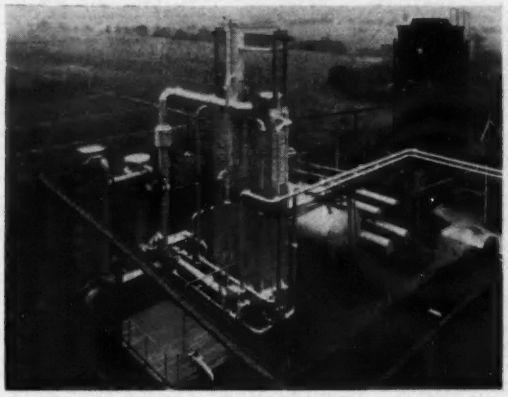
Last November, Monsanto Chemical reported expansion plans to add 200 million lb. a year to present capacity of 360 million lb.; the first 100 million lb. is due on stream by 1961, and the remainder by 1962. Total capacity would be 560 million lb. a year.

A 40-million-lb.expansion is planned by Foster Grant at Baton Rouge and should be completed this year. This company's total capacity would then be raised to 150 million lb. a year. A small expansion which would add about 10 million lb. capacity a year to Odessa Styrene is expected to be completed this year.

The other U.S. producers, Union Carbide Chemicals and Shell Chemical have not announced any styrene expansion plans. Major sales in polystyrene resins have been in moulding and extrusion compounds. Last year around 800 million lb. were sold. The other main market for styrene monomer is styrene-butadiene rubber (SBR). This year the U.S. expects to take 495 million lb. for SBR and by 1965 is estimated to take some 560 million lb. of styrene.

Project News

W. C. HOLMES INSTALL FIRST U.K. GAS DEHYDRATION PLANT



Gas dehyration plant installed at the Lostock Hall Works of the North-Western Gas Board

A GAS dehydration plant, designed by W. C. Holmes and Co. Ltd., has been installed recently at the Lostock Hall Works, Preston, of the North Western Gas Board. It is the first plant of its type in the U.K. Previously dehydration has been effected with calcium chloride as the drying agent.

The plant was designed both for the drying of the high pressure supply boosted to Blackpool, which was not expected to be a continuous operation, and also for the local low pressure supplies. The refrigerated brine is used for cooling the high pressure stream and surplus chilled brine not required for this purpose is used to cool the local town gas supply. In this way, the maximum use is made of the refrigerating plant capacity.

The plant has been designed to handle 5 million standard cu. ft. of gas per day at pressures of 10-16 p.s.i., and to chill the boosted gas to a dew point of 370°F at all times of the year. Dependent on the load and ambient temperatures, it can also produce an average reduction in dew point of approximately 6°F in the local low pressure gas stream.

In operation, the high pressure gas, at approximately 8-10 p.s.i., passes through the after cooler where the heat of compression is removed. The gas is then cooled in a heat exchanger with the final chilled gas before passing to the main cooler. The main cooler, which is of cross tube design, is fed with chilled brine by way of a constant head pot from a 6,000 gall. chilled brine storage tank. The chilled gas passes through a mist catcher and finally cools the incoming gas.

Any surplus brine pumped up to the constant head pot and not required for high pressure gas cooling, is diverted to the low pressure gas cooler. This cooler is also of cross tube design and both coolers are fitted with condensate drains. The condensates from the high pressure cooler, after-cooler and heat exchanger are collected in a condensate tank, which is emptied regularly, utilising the gas pressure to discharge the liquid.

The circulating brine is cooled in a standard compressed ammonia type refrigerating plant. This plant, with the high pressure coolers, brine circulating pumps and instrument air compressors is supplied in duplicate to avoid any interruption to the process should mechanical troubles develop or when the plant is being serviced.

Dewpoints of the cooled gases are controlled by air-operated brine control valves, working in conjunction with cool gas temperature recorders and controllers. Cooling of the circulating brine is controlled by a thermostat located in the 6,000 gall. brine storage tank. This tank, which is kept full, provides at least two hours' reserve of chilled brine when the refrigeration plant cuts out, thereby avoiding rapid on/off cycles. Cooled brine temperatures are generally between 30-35°F and at these temperatures there is no tendency for ice to form in the gas coolers. In practice the plant has operated for several hours with the brine at 25°F without any increase in cooler back pressure which would suggest that no ice is formed at this temperature.

Chemico to Build Hydrogen Plant for Rhodiaceta

● THE Chemico organisation is to build a plant for the production of hydrogen gas near Lyon, France, for Rhodiaceta, a subsidiary of Rhône-Poulenc. The plant will produce 3,000 M_3/hr. of hydrogen gas by reforming Lacq natural gas, the resulting gas will be extremely pure containing less than 5 p.p.m. of carbon monoxide. Chemico will provide design, engineering and construction of the plant, which is scheduled to start operating early next year.

● WORK is to start almost immediately on the building work of a £1.6 million cellulosic film factory for British Enka Ltd., at Aintree, near Liverpool, state Holland and Hannen and Cubitts (North West) Ltd., Bromborough, Ches. The plant, which marks the first stage of British Enka's plans for the production of viscose-based wrapping films in this country, is due to go into production early in 1961.

● THE Steel Company of Wales have awarded a contract to Simon-Carves for gas-cleaning plant on two 400-ton open-hearth furnaces being installed at Port Talbot. The contract includes dust-conveying and disposal equipment.

● DESIGN, engineering, procurement, construction and assistance during commissioning of three sulphuric acid concentration units, including process and service pipework, are in hand by Constructors John Brown Ltd., at the Spondon site of British Celanese Ltd.

C.J.B. are also supplying some plant and equipment for a vegetable oil plant under construction at Karachi, Pakistan.

● A CONTRACT valued at £3,500 for demineralisation plant has been awarded by the U.K. Atomic Energy Authority at Harwell, to William Boby and Co. Ltd., water treatment engineers.

● GEORGE WIMPEY AND CO. have been awarded a £200,000 contract by I.C.I. for site preparation and building at Thornbury, near Bristol.

● THE Mitchell Construction Co. have been awarded a contract for construction of a second primary separation plant at the U.K.A.E.A. Windscale works, Sellafield, Cumberland. Work will commence immediately and take some three years to complete. The contract covers main civil engineering and building works for the separation plant which will service fuel elements from the new civil nuclear power stations.

● FOSTER WHEELER LTD. have been awarded a contract for a complete 'grass-roots' refinery for Dansk Veedol A/S, at Kalundborg. The refinery will be based on a crude unit with a capacity of 20,000 barrels/day, with the vessels designed for a future throughput of 40,000 barrels/day. The refinery will include the following units—desalter unit, atmospheric crude distillation units, comprising naphtha splitter and a light straight run gasoline stabiliser, a naphtha hydrodesulphuriser, catalytic reformer, light straight run gasoline treating unit, kerosene treating unit, chemical and L.P.G. facilities, vacuum gas oil hydrodesulphuriser, blending facilities, vacuum distillation unit, boiler plant, tankage, workshops, offices, laboratories, etc.

In keeping with the trend developed by Foster Wheeler to minimise costs and to reduce the danger of pollution and its effect on local amenities, the refinery will use airfin coolers. This contract represents the fourth complete refinery awarded to Foster Wheeler Ltd. in the last three years.

★ WHEN Midand Silicones established their Barry, Glam, silicone unit six years ago it was Europe's largest and was widely regarded as a model of automatic process control. Last week when I saw the new rubber plant at Barry, a new pilot plant and a new laboratory building, Mr. C. B. Evans, works director, told me that Midsil believed they still held those two distinctions and they firmly intended that "by the right use of our intensive development effort we shall continue to do so."

Further projects are in hand to double production of both silicone fluids and resins. When completed towards the end of this year they will raise total capacity to "between 1 and 4 million lb. a year." That is the nearest that Dr. R. A. Gregory, joint managing director, would go to giving a total potential at Barry.

With the severe dumping of French products now behind, thanks to the Board of Trade's first anti-dumping measure, the sales section is looking for new markets to conquer. An exploratory mission to Hungary, Poland and Czechoslovakia, was followed more recently by the visit of Dr. Gregory and Mr. A. K. Simcox, general sales manager, to Moscow. They met an "encouraging reception" because Russia is not producing enough silicones to meet her own needs. Sales have also been made to mainland China.

★ THE new consultancy service offered by Constructors John Brown for the installation and equipment of process and control laboratories (see p. 769) marks a new venture for this versatile company. C.J.B. have already gained much experience in the design and installation of process laboratories on their various projects and the new development, therefore, is a logical step.

Since modern chemical plant requires a high degree of control, plant economies depend on the efficient functioning of the control laboratories. Their correct design fully co-ordinated with plant needs must mean an increase in operational efficiency. From that point of view, this new C.J.B. service combines experience in plant construction and process engineering with considerable laboratory design and installation know-how.

★ LAST week in London, Mr. C. B. Branch, president of Dow Chemical International, accompanied by Mr. Robert H. Gregory, managing director of Dow Chemical Co. (U.K.) outlined the company's major reorganisation aimed at expanding overseas manufacturing operations. Export sales rose 18% to a record level in 1959 and Dow now have 14 sales offices in 12 countries. Dow Chemie A.G. was formed recently at Basle to finance overseas manufacture.

The U.K. subsidiary is expanding its sales activities to introduce new Dow products to British customers, while Dow Agrochemicals Ltd. are completing construction of their Dowpon plant at Kings Lynn. Dow have also with the Rio Tinto Group recently acquired Thorium Ltd. With the Distillers Group, Dow also own a polystyrene plant at Sully, Glam, where Styron is made and sold by British Resin Products.

Styron is to be made in Italy, while in Greece Dow have Government investment approval for another polystyrene plant. With Pechiney, Dow are to build a large plant for Styron and Saran in France, while the Dutch subsidiary is expanding with a styrene/butadiene latex plant. C.S.R.C.-Dow Pty. formed to make styrene near Melbourne with C.S.R. Chemicals, are now also to produce ethylene dichloride, caustic soda and chlorine. Asahi-Dow have completed a styrene-monomer plant in Japan.

★ AN attractive coloured brochure that reached my desk last week has been produced by the Sondes Place Research Institute to describe their sponsored research service for industry. Evolved from a consulting chemical and chemical engineering practice founded in London in 1936, the institute was incorporated as a limited company in June 1947, when the move to Dorking was made.

Most of the institute's work is on either information, project assessment, laboratory research, analysis and testing, pilot plant development, plant design and mechanical prototyping. Each of these sections is described in the brochure. Under project assessment, work includes thermodynamic studies, cost analysis, technical reviews of properties, market surveys and examination of the patent position—a programme that eliminates hit-or-miss tactics.

More than 1,800 projects have been handled and the processes include corrosion prevention, effluent treatment, electrodialytic desalting, gas absorption and purification, heavy chemicals production, oil extraction, organic syntheses, powder, granulation, solvent extraction, production of monomers and synthetic resins, waste product utilisation and water treatment.

★ A PLEA to food manufacturers from Dr. Stanley Jeffs, a general practitioner, not to turn Britain into a nation of 'chemical pill eaters' was made at the Torquay congress last week of the Royal Society of Health. The public would eat anything, even chemicals, and Dr. Jeffs complained that we no longer ate any more food! It was tissue producing proteins, super-vitaminised flakes, decarbonised rolls and straight chemicals—sucrose, sulphur dioxide and several others.

Hydrogenation of fats had rightly been accused as being instrumental in causing coronary thrombosis and other diseases of the arteries and Dr. Jeffs urged the food industry to be very careful because it was "playing around with the lives and health of millions of people."

Dr. A. E. Bender, hon. secretary of the S.C.I. Food Group, said the main point behind chemical additives was the feeding of large centres of population; the production and storage of food in large quantities to feed, say 12 million people in London with a limited amount of food-producing land in the vicinity. The only way was to preserve the food. He added that in the use of chemical preservatives, there were many safeguards to protect the consumer.

★ WITH the increasing importance of river pollution problems and the discharge of noxious liquids, including radioactive wastes, it is particularly appropriate that an exhibition and convention should be planned at which these problems can be described and discussed.

Simultaneously with the first effluent and water treatment exhibition to be staged at Seymour Hall, London, from 18 to 21 October, there will be a convention held with the co-operation of a number of specialised institutions dealing in such problems, and papers will be read by leading experts. Both public and industrial attention is likely to be focused on the subject as a result of these activities, which will, I imagine, receive wide interest.

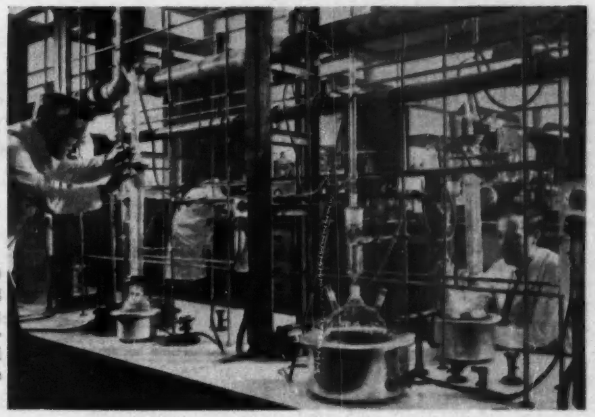
Convention subjects will also include analysis techniques, biological effluent treatment, discussion of the Armour Committee Report, fluoridation and manufacturers' problems in waste disposal. The exhibition is being organised by Thunderbird Enterprises Ltd., 140 Cromwell Road, London S.W.7.

★ AN answer to a problem that has not infrequently been referred to in these columns—that of the dissemination of technical information, and the virtual impossibility of reading all the journals in one's sphere of interest—has been provided by the American Chemical Society, 2 Park Avenue,- New York 16, N.Y., and the International Business Machines Corporation.

A versatile IBM computer has been 'trained' to index thousands of articles appearing in leading chemical journals of the world. The end product is a 104-page semi-monthly publication named *Chemical Titles*.

Alembic

NEW RUBBER SILICONE UNIT AND PILOT PLANT FOR MIDSIL



Laboratory - scale work, including reaction, extraction and fractionation, is carried out on a lattice bench

TWO new projects of a major capital construction programme initiated in 1958 were recently brought into operation by Midland Silicones Ltd. at their Barry, South Wales, works. These are a new silicone rubber production building and the development department's pilot plant. A new laboratory building represents the completed first phase of the company's present laboratory extension programme—the next step will be a new building for fundamental research.

The construction programme is continuing unabated, said Mr. C. B. Evans, works director, last week. New projects now on hand include a large new warehouse, a new fluid production unit that will more than double present capacity and additional resin manufacturing capacity on a similar scale, part of which is already installed. These projects should be completed towards the end of this year.

The new rubber plant was designed by Midland Silicones and the equipment was tailor-made to the company's own specifications. Before the new laboratory block was designed, visits were made to Dow Corning, Midland, Mich., who jointly own Midsil with Albright and Wilson Ltd., and to other new laboratories in the U.K.

Rapid Sales Expansion

Mr. Evans said that the new buildings were called for by rapid expansion of silicone rubber sales, particularly because of the cable industry's demands which were much increased following an Admiralty decision to specify silicone insulated cables for all new naval vessels. New equipment was also called for to permit the production of improved and new products that originated through the company's intensive development effort.

Rubber Plant. The new silicone rubber production plant at Barry, claimed to be the most modern in Europe, has now been in operation for several months. To maintain a high standard of purity in Silastomer silicone rubber, layout and equipment were designed with great care. Air is filtered when entering and leaving the building. Both the roof and the floor are made of special dust-free materials. While allowing for future expansion, the layout was conceived so that operations like the handling of fillers and milling them into the silicone rubber polymer, which inevitably produce some dust, are kept apart from the final stages where the near-finished product is handled.

Working all the year round on a 24-hour day basis, the plant now turns out some six dozen different silicone rubber products, whereas the former rubber plant handled only about one dozen different products three years ago. Many of the products currently made here have been developed at Barry to meet individual needs of various industries.

An important feature is the stringent control on materials through all the stages of production and the exhaustive testing of the finished product.

Process and Product Development. Main work of the product development group is to develop new silicone fluids, resins, greases and rubbers, and to modify existing ones to meet specific demands. The nature of the work is mainly short-term applied research, though more fundamental work is also being carried out, particularly on organosilicon intermediates and polymers.

The process development group is concerned with developing manufacturing processes for new and existing products. Its work includes scale-up from laboratory equipment, through pilot plant, to full-scale production, the investigation of current processes with a view to increasing their efficiency, and the design of entirely new processes.

There is also a patents and technical information section which writes up patent specification to cover Barry inventions, to deal with customer queries regarding patents, and to undertake patent and information searches before the department starts on any product or process development projects.

In view of the company's policy to expand research and development, a group whose work will be devoted to fundamental research is to be formed. It will be housed in a further new laboratory block.

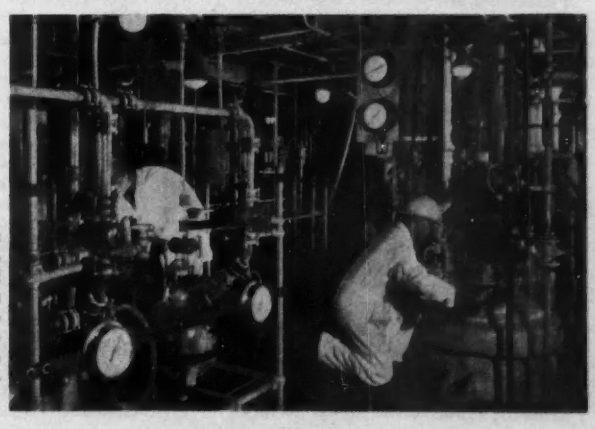
Pilot Plant. While the product development group and the patents and technical information section share the new laboratory block with technical service department laboratories, the process development group is housed in the the pilot plant building. Here production equipment is duplicated on a smaller scale and used mainly for investigational purposes.

The building is divided into five principal areas, the first housing the larger-scale pilot equipment (50-300 gall.) used for processes such as hydrolysis, polymerisation, simple and fractional distillation, emulsification and filtration. Examples of the work carried out concern the manufacture of finished silicone fluids needed for special applications, and production of the newer chlorosilane intermediates as well as investigation of standard processes.

High-pressure and vapour phase reactions are studied in the second area, which is separated principally for safety reasons. Special features include cubicles with double walls of steel for housing high-pressure equipment; special locking devices prevent entry while equipment is being operated. External blast walls are an added precaution.

The third section, containing glassware and other smaller units of 5 to 25 gall., undertakes initial scale-up experiments.

The fourth unit is a laboratory for investigating scale-up and other process problems, while the fifth area houses rubber equipment such as mills, mixers



Hydrolysis section of the pilot plant, where the initial chemical reaction in silicones production—the hydrolysis of a mixture of chlorosilanes—takes place

and extruders needed for the examination of silicone rubber manufacturing problems.

Technical Service. Thirty-five scientists and technologists are employed in a department with "more experience in the industrial application of silicones than any other organisation in Europe" to help customers to use silicones to best advantage. Their expert advice covers techniques, formulating and processing, practical demonstrations and investigation of special problems. This may involve adaptation of products to fit into a customer's production schedules and includes 'trouble-shooting' at customers' own factories.

The department's work may, as happened recently, consist of the development of a new application for a silicone product. After preliminary studies had showed a need for rollers covered with silicone rubber, several months of laboratory work were devoted to solving such technical problems as the production of a satisfactory rubber-to-metal bond and shortening the current schedule. The information gained was passed to a rubber processor who then, with the assistance from the department, translated it into a production scale operation.

U.K. Deliveries of Petrochemical Feedstocks Rose 50% in 1959

ACCORDING to the *Monthly Digest of Statistics*, U.K. production of sulphuric acid (as 100% acid) in January totalled 225,700 tons (214,300 tons in January 1959; 1959 monthly average of 202,300 tons). Consumption, including recovered sulphuric acid in January, was 227,200 tons (209,000 tons in January 1959; 1959 monthly average of 204,600 tons).

The following table shows consumption of sulphur, etc., for sulphuric acid and stocks:

SULPHUR, ETC. FOR SULPHURIC ACID

Consumption in '000 tons

	Jan. 1960	Jan. 1959	Monthly Average 1959
Sulphur* ...	37.9	32.4	31.7
Pyrites	32.1	30.5	26.6
Spent oxide ...	20.9	20.4	18.4
Anhydrite ...	54.5	70.5	62.3

Stocks in '000 tons

	Jan. 1960	Jan. 1959	Monthly Average 1959
Sulphur* ...	60.0	85.6	61.2
Pyrites†	135.6	176.1	156.8
Spent oxide ...	86.8	98.6	88.5

* Inc. filter cake & boiler bottom
† Excluding Government stocks

Fertilisers. Production of P_2O_5 fertilisers totalled 36,700 tons in January (33,900 tons in January 1959; 1959 monthly average of 32,800 tons). Home deliveries in January were 37,900 tons (31,800 tons in January 1959). Home deliveries of liming materials in January totalled 256,800 tons (236,500 tons in January 1958; 1959 monthly average of 507,400 tons).

Petrochemicals. A 29% rise in U.K. deliveries of feedstocks for petrochemicals was recorded in 1959 when the total rose to 1,066,800 tons (821,600 tons in 1958). The 1959 monthly average was 88,900 tons (69,300 tons in 1958). The January-February monthly average of 120,200 tons, represents a 49% rise over the January-February 1959 monthly average of 80,500 tons, and a 63% rise over the comparable 1958 figure.

According to the Petroleum Information Bureau, U.K. production of refinery bitumen totalled 961,248 tons in 1959.

Synthetic Dyestuffs. Production of synthetic dyestuffs, excluding dyestuffs intermediates and synthetic organic pigments, in 1959 totalled 29,030 tons, compared with 24,080 tons in 1958 and 30,680 tons in 1957.

Synthetic rubber consumption averaged 1,490 tons a week in 1959 (1,210 tons/week in 1958 and 2,090 tons/week in January 1960). Stocks of synthetic rubber in January were at a weekly average of 9,500 tons (not including importers' stocks), compared with 12,810 tons in January 1959 (including importers' stocks). Production of carbon black, including lamp and vegetable black, but excluding acetylene and bone black, averaged 2,310 tons a week in 1959 (2,100 tons/week in 1958). Weekly average for January 1960 was 2,570 tons (2,040 tons in January 1959).

Chemical Plant. Deliveries of chemical plant in 1959 were valued at a provisional figure of £37.3 million (£50.3 million in 1958).

Miscellaneous. Production of industrial ethyl alcohol in 1959 averaged 3.96 million proof gall. a month (3.93 million in 1958). The figure for January 1960 was 3.82 million proof gall. (3.73 million in January 1958). Output of penicillin averaged 3,660,000 (3,661,000) mega-units a week in 1959. January-February 1960 weekly average was 4,369,500 mega-units.

A.R.C. Set Up Weed Research Organisation

A NEW Weed Research Organisation is being set up by the Agricultural Research Council to assume some of the present functions of the Council's Unit of Experimental Agronomy at Oxford University. The new organisation has been created to extend the applied research which lies between the basic scientific investigations being carried out at the unit and the introduction of new methods of weed control in agriculture and horticulture.

To provide the facilities required to enable the organisation to carry out this work the Council has acquired a farm near Oxford where a laboratory and other buildings are to be provided. Director of the new organisation will be Dr. E. K. Woodford, at present assistant director, under Professor G. E. Blackman, of the A.R.C. Unit of Experimental Agronomy.

The organisation will maintain close liaison with the unit which will continue its main purpose of fundamental research concerning the factors which determine the selective action of compounds toxic to plants.

U.K. Chemical Exports Rise 14%, Imports Higher by 50%

BRITISH exports of chemicals in the first quarter of 1960 totalled £78.2 million, a 14.1% rise on the same period last year. There were big rises in shipments to Holland, up £1.36 million to £4.1 million and to West Germany, up £989,000 to £3.2 million. Large increases were also recorded in shipments to South Africa, Pakistan, Malaya, Hong Kong, Australia, New Zealand, Eire, and Russia.

Shipments of chemical elements and compounds were £6.1 million a month, the same as for the fourth quarter 1959, but 13% higher than a year earlier; the figure for plastics materials was £3.8 million a month (same as in the fourth quarter 1959, but 28% higher than in January-March 1959). The three months total for coal tar chemicals was £1,023,151 (compared with £897,138).

Imports of chemicals totalled £45.4 million, an increase of 50% over the same period last year. There were substantial increases in most of the main categories, with a marked rise of 80% in plastics materials, p.v.c. imports rising from £839,300 to £1,572,800. Imports from the U.S. rose 95% or £2 million a month. On the other hand exports to the U.S. rise only slightly, while those to Canada fell somewhat.

D.C.L. to Expand Australasian Interests

PHARMACEUTICAL interests of the Distillers Company Ltd. in Australia and New Zealand are to be expanded following a four-week tour by Mr. Ernest G. Gross, a director of the company and Mr. D. J. Haymen, sales director.

In Australia all the marketing activities of biochemicals will be expanded and some tablet production will be undertaken. This step will affect the agreement with the British Drug Houses (Australia) Pty, who have handled sales of D.C.L. pharmaceutical products throughout Australia. To obviate any hiatus in distribution, the company will continue to sell Distillers' pharmaceuticals until early next year.

A new marketing organisation is to be set up in New Zealand and a new company is being formed.

New Firm to Handle Bulk Liquid Chemicals

A NEW joint company, Prochimar S.A., has been formed in France by C. P. Steuber and Co. Inc., New York, and their U.K. associates, Stratton Chemicals Ltd., with an initial capital of N.Fr.120,000, and offices at 217-219 Rue du Faubourg St. Honoré, Paris 8.

The new company will extend to France the established services in shipping and distributing of bulk liquid chemicals; substantial contracts have already been negotiated on behalf of three different U.S. principals. Inquiries from U.K. firms interested in developing similar business in France should be addressed to Stratton Chemicals Ltd., 17 Stratton Street, London W.1.

DRUG FIRMS TO CO-OPERATE IN DEVELOPING M.R.C. PROJECTS OF INDUSTRIAL IMPORTANCE

NEW arrangements recently agreed in principle between the Medical Research Council and the Association of British Pharmaceutical Industry should enable manufacturers with the necessary research and development facilities and expertise to join in the development of projects of potential industrial importance that originated in the M.R.C. laboratories.

This was stated at the annual dinner of A.B.P.I. held in London on 26 April by Mr. E. D. Carey, retiring president, when he proposed the toast 'Our Guests.' Mr. Carey added that the industry welcomed the opportunity of placing its knowledge, experience and resources at the disposal of the Council, while continuing independent research in its own chosen fields. The industry's own research effort had risen each year, reaching a cost of £5 million in 1958. The National Health Service also benefited from the large sums spent on research in the U.S., Switzerland and in other countries whose pharmaceutical companies had U.K. production subsidiaries.

Voluntary Price Scheme

A.B.P.I. was now reviewing with the Health Departments the voluntary price regulation scheme for medical speciality products, which ended its initial three-year trial in June. The view that the scheme had not been a success was based on inadequate evidence and on misunderstandings. In no other comparable field had such price restraint been shown as with pharmaceutical preparations. Between 1954 and 1959 the price index of all manufactured products rose by 11.4%, the rise for their preparations was only 1.4%.

Real success of the scheme could not be measured by savings to the Exchequer—which could not amount to more than a tiny fraction of Health Service costs—but by its total and long-term effect on the industry's contribution to the national health and economy.

Replying to the toast, Miss Edith Pitt, Parliamentary Secretary to the Ministry of Health, said it seemed to Ministers that there was still room for price cuts by some manufacturers without reducing rewards below a fair and reasonable level, or damaging research and development potential; and she urged the industry to be rigorous in looking for opportunities to pass on production economies.

The Ministers sought, through the voluntary price regulation scheme, or any arrangement that might succeed it, to ensure that prices were fair and reasonable. They knew that research had to be paid for and knew that the complex products of research were often intrinsically expensive. They also recognised that manufacturers were entitled to reasonable rewards. They accepted that prices should reflect the industry's proper needs and should secure a continuing incentive to research.

The recommendation of the Hinchcliffe Committee that a clinical trials committee should be set up would be discussed within a few days between A.B.P.I. representatives and the Minister. The suggestion that a new advisory body on costs in the pharmaceutical service should be set up was constructive and the Minister would no doubt shortly make known his decision on this proposal.

Annual Report. Annual report of the association reviewed discussions with the Ministry of Health and Scottish Department of Health regarding the recommendations of the two committees on the cost of prescribing. Also dealt with are the voluntary price regulations scheme, the A.B.P.I. statement to M.P.s on the report of the Comptroller and Auditor General; and a statement of labelling principles. The association has accepted an invitation to submit evidence to the Working Party set up to review pharmaceutical legislation.

Exports are also dealt with, as are the relations of members with the European Free Trade Association. Statistical tables are provided on production, employment, exports, imports, N.H.S. prescriptions and expenditure, and the wholesale price index.

As stated in p. 778, Mr. H. W. Palmer, managing director of Glaxo Laboratories, has been elected president for 1960-61.

Two Chemistry Professors Appointed to Chairs in London and Aberystwyth

TWO outstanding chemists appointed to chairs of chemistry are Dr. B. C. L. Weedon and Dr. A. F. Trotman-Dickenson, whose appointment was referred to in CHEMICAL AGE, 16 April, p. 655.

Dr. Weedon, Ph.D., D.Sc., A.R.C.S., D.I.C., F.R.I.C. who was born in 1923, is at present reader in organic chemistry at Imperial College, an appointment he has held since 1955. Educated at Wandsworth School and the Imperial College (1940-45), his B.Sc. and A.R.C.S. were gained in 1942 and were followed by a Ph.D. and D.I.C. in 1945 for work on the reactions of acetylene alcohols under the supervision of Dr. (now Professor) E. R. H. Jones. He became a Fellow of the Royal Institute of Chemistry in 1954, was awarded a D.Sc. in 1955, and gained the Meldola medal in 1952.

Dr. B. C. L. Weedon, appointed Professor of Organic Chemistry, Queen Mary College

Dr. Weedon was a research chemist with I.C.I. Dyestuffs Division from 1943 to 1957 and joined the Imperial College as a lecturer in organic chemistry in 1947. With nearly 100 publications, joint and otherwise, he has worked on vitamin A analogues (with Sir Ian Heilbron); anodic syntheses (with Sir Patrick Linstead); cartenoids: synthesis of methylbixin, corticrocin, canthaxanthin, echinenone and astacene; the structure of spirilloxanthin, capsanthin and capsorubin; synthesis and reactions of fatty acids; stereochemistry and synthesis of phytol and related terpenes.

Dr. Aubrey Fiennes Trotman-Dickenson, B.A., Ph.D., D.Sc., who has been appointed Professor of Chemistry at the University College of Wales, Aberystwyth, with effect from 1 October, was educated at Winchester College and Balliol, Oxford. He is the sixth pupil of R. P. Bell to become a professor of chemistry; three of them were also Frazer Scholars from Winchester. They are Dewar, Danckwerts and Longuet-Higgins. His first research work on diffusion controlled reactions under Lord James of Rusholme, was followed by acid-base catalysis with R. P. Bell. His interest in gas kinetics and free radicals was determined in Ottawa from 1948 to 1950. From then to 1953 he was an assistant lecturer and I.C.I. fellow at Manchester University. In 1953-54 Dr. Trotman-Dickenson served as a research chemist with E.I. du Pont de Nemours at Niagara Falls, N.Y., and from 1954 has been lecturer in chemistry at Edinburgh University, where he gained his D.Sc. in 1957. His publications include 'Gas Kinetics', 1955, 'Free Radicals', 1959, and, in the press, 'Gas Chromatography', with J. H. Knox. He has been working principally on determination of rate constants of elementary reactions in gas phase and explanations of them.

I.C.I. Seek Employees' Views on Pension Scheme

PROPOSAL that their employees should participate in the new State graduated pension scheme is being made by Imperial Chemical Industries Ltd. A final decision will be made when employees have given their views through joint consultation channels.

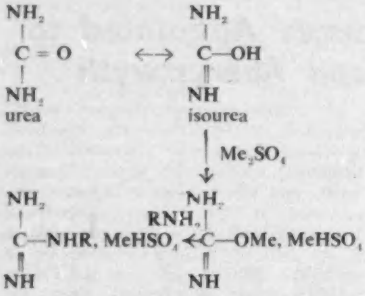
I.C.I. do not intend to alter the contributions or benefits in their funds so long as contributions and benefits under the State graduated scheme remain at the initial rates. The company's pension funds would qualify for approval to contract out of the State scheme.

NEW METHODS OF PREPARING QUANIDINE SULPHATES

N.R.D.C. Inventions for Licensing

NEW methods of preparing quanidine sulphates or substituted quanidine sulphates are described in Patent applications cog. 8979/49, 16762/49, 16880/49, 18892/49 and 9324/52. They are one of a number of inventions available under licence from the National Research Development Corporation, 1 Tilney Street, London W.1. and are referred to in the *N.R.D.C. Bulletin* No. 16.

It is stated that *o*-alkyl isourea hydrogen sulphates are treated with ammonia or amines. *o*-Alkylation of urea in the first stage with a dialkyl sulphate proceeds at best in the absence of alkali or solvent.



p-Aminosalicyclic Acid. Canadian work to overcome the disadvantages of PAS in the treatment of tubercolosis—the drug has a nauseating taste, it may give rise to gastro-intestinal disturbances, and PAS itself is of limited stability—is described in Patent application 16827/58. Acylating PAS with an amino acid residue, e.g. L-glutamic acid, gives a pleasant-tasting water soluble, stable compound.

This is not hydrolysed by the enzyme systems of the stomach or pancreas, but is broken down by the enzymes of the intestinal mucosa. Absorption of it resulting PAS from the intestine gives a high concentration of drug in the blood stream.

Preparatively, *p*-aminosalicyclic acid is treated with carbobenoxy-L-glutamyl anhydride and the protecting group is then removed from the product by reduction. For some clinical uses, it might be preferable to convert the free acid to a suitable salt, for example, the mono- or disodium or potassium salts which have the advantage of higher water solubility.

Polyurethane Foams. As a modifying agent to control bubble growth in the production of polyurethane foams, it has been found that a so-called 'half-second' grade of cellulose acetate butyrate can be dissolved in the alkyd on heating and remains in solution on cooling. Alkyds modified in this way are stable for storage purposes. (Patent application 37016/54.)

Epoxy Resins. Patent application 3341/59 concerns a primer for promoting the adhesion of polyurethane resins to other materials and comprises an epoxy resin with a hot-setting tertiary amine hardening agent. The primer may be made as a solution to facilitate its application to the surface of the mould or other object.

An epoxy resin composition (Patent application 23489/48) provides a suitable surface coating with improved wetting properties and resistance to cratering a cissing.

Anti-cholinesterase Inhibitors. Quaternised pyridine aldoximes are effective antidotes for organo-phosphorus insecticidal compounds which in sufficient concentrations cause death in humans and animals by inhibiting the enzyme cholinesterase. It has been discovered (27902/57) that quaternised pyridine aldoxime hydrocarbonsulphonates are particularly effective and small doses are sufficient mainly because they are very water soluble. A mixture of aldoxime with atropine is considerably more effective than either compound separately.

Further experiments have confirmed the opinion that the atropine-oxime sulphonate mixture can be effectively administered intramuscularly and orally to humans. These experiments have included a direct determination of the intramuscular and oral toxicity of the oxime sulphonate.

Storage Batteries. Patent No. 803879 describes a thermal decomposition method of impregnating a porous sintered nickel plaque with nickel hydroxide for use in nickel-cadmium storage batteries. The procedure can be carried out in a single impregnation cycle and is less time-consuming and expensive than in previous methods. The electrolytic conversion step is also accomplished without the loss of active materials following the immersion in the molten salt bath.

Rotating Tube Heat Exchanger. By rotating a tube and incorporating suitable baffles to prevent the fluids moving with the tube to increase relative velocity between the tube wall and fluids on each side of it, overall heat transfer coefficients of about 2,000 CHU/hr./sq. ft./°C may be achieved (7194/56). The heat exchanger may have applications where weight and space are restricted.

Pipe Joint. A pipe joint (25636/57) was developed for use with highly toxic chemicals. Male and female grooves are formed in the inner and outer tubes and to make the joint a sleeve of material between the tubes is deformed by an axial load to fill the grooves and give a locked joint.

Titanium Solder. Unalloyed silver as a solder for some titanium alloys and unalloyed aluminium as a solder for others have given discouraging results, but the inventor (9090/57) has obtained good results with a solder comprising up to 85% of silver. The balance consists of either aluminium alone, or mainly aluminium with small proportions of one or more of the strengthening elements, titanium, nickel, copper, manganese or silicon.

Sludge Aerator. A surface-type aerator for regenerating flax-setting liquor (37140/56) is of simple expanded metal construction and cheaper than normal brush aerators. It may have applications in sewage treatment.

Fate of Dalton Tombstone Not Yet Decided

WHAT will be the fate of the two-ton, polished granite tombstone of John Dalton, chemist and physicist, who was born in 1766 and who, before his death in 1844, had done perhaps more than any man to elevate chemistry into a veritable science?

Among the organisations interested in the tombstone now that the Manchester Corporation has acquired the cemetery for eventual conversion into playing fields are the Royal Society, the Royal Institute of Chemistry, the Chemical Society, and Manchester Literary and Philosophical Society.

Some years ago the R.I.C. paid out a sum of money to have the stone cleaned, and, with its 20 ft. square enclosure, the memorial is in good condition. The Manchester Literary and Philosophical Society, in whose premises Dalton had his laboratory, would like to incorporate the stone in its new headquarters, now nearing completion.

But the cost of cutting and moving the stone would be too heavy for the society to bear alone.

Twice a vice-president of the British Association, Dalton developed the atomic theory, and carried out research on the absorption of gases by water; while his chief physical researches were on the constitution of mixed gases, the elasticity of vapours and gas expansion by heat. He it was, too, who first described the phenomenon of colour blindness, observed by him in his own case and that of his brother.

At his public funeral, before the lying in state at Manchester's Old Town Hall, the cortege extended to a mile in length and was followed by thousands.

John Dalton's tombstone

B.A. Annual Meeting at Cardiff

ANNUAL meeting of the British Association for the Advancement of Science will this year be held at Cardiff from 31 August to 7 September, under the presidency of Sir George Thomson, F.R.S. Sir George's presidential address on 'The two aspects of science,' will be given on 31 August in the Sophia Gardens Pavilion. A symposium will be held on world food and population with papers by Dr. N. C. Wright, C.B., deputy director-general, Food and Agriculture Organisation, Sir Alexander Fleck, B.A., past-president, and others.

President of the chemistry section (B) is Dr. James Taylor, M.B.E., chairman Imperial Aluminium Co. Ltd. and a director of I.C.I., whose presidential address will be entitled 'Chemistry is not enough.' Section B vice-presidents are Prof. A. G. Evans, Prof. D. P. Evans, Dr. R. A. Gregory, Prof. C. H. Hassall Dr. B. Jones, Prof. W. R. D. Jones, Dr. R. M. Lodge, Mr. V. L. McGrath, Dr. D. S. P. Roebuck, Prof. M. Stacey, F.R.S., and Dr. J. J. P. Staudinger. The recorder is Dr. I. J. Faulkner, hon. secretaries are Dr. Bernard Atkinson, and Prof. W. G. Overend; local secretaries are Dr. A. R. Pinder and Mr. R. F. Stephens.

Chemistry section papers will deal with the technical development of polythene; commercial development of a new product; polymer chemistry and silicones.

Fifth British Weed Control Conference

FIFTH British weed control conference will be held by the British Weed Control Council at the Grand Hotel, Brighton, from 7 to 10 November. Those wishing to submit papers should indicate the subject matter to the programme secretary, Mr. C. Parker, A.R.C. Unit of Experimental Agronomy, Department of Agriculture, The University, Parks Road, Oxford.

Subjects to be covered are: 'The impact of herbicides on crop husbandry', with Prof. H. G. Sanders, president, B.W.C.C., and Dr. P. K. Bucholtz, president, Weed Society of America, as speakers; 'Weed control in arable crops', discussion to be opened by C. V. Dadd; 'Improvement of pastures and hill grazing'; 'Bracken'; 'Problems of advice and education', discussion to be opened by W. E. Jones, with contributions by a farmer, a merchant and a manufacturer (Dr. E. Holmes); 'Control of grass weeds'; 'Weed control in horticultural crops', with P. H. Brown as speaker; 'New herbicides'; 'Weeds of waterways', with Dr. H. G. van der Weij as speaker; 'New techniques'; 'Translocation and fate of herbicides in plants', with Dr. C. McCready as a speaker.

Conference registration fee is £6 10s and includes a copy of preprints, a copy of the proceedings and an invitation to the conference banquet on 8 November. Conference secretary is W. F. P. Bishop, 52 Bedford Row, London W.C.1.

DISTILLATION SYMPOSIUM OPENED BY SIR ALEXANDER FLECK

IMPORTANCE of distillation as a modern technique was stressed by Sir Alexander Fleck, K.B.E., F.R.S., M.I. Chem. E., who retired as chairman of I.C.I. earlier this year, when he opened an international symposium on distillation in Brighton on 4 May. Attended by 600 leading chemical engineers, from 14 countries including the U.S. and Russia, the symposium was held under the auspices of the European Federation of Chemical Engineering.

Mr. W. K. Hutchison, C.B.E., president, Institution of Chemical Engineers, presided at the opening ceremony held in the Dome, Brighton and at the last technical session on 6 May. Mr. E. W. Greensmith, chairman, Chemical Engineering Group, Society of Chemical Industry, presided at the finishing session.

In his opening address, Sir Alexander briefly reviewed distillation from early days. To give an indication how important distillation had become, he said that in 1935 the distillation load of I.C.I. was estimated at 295,000 tons a year; in the years soon after the end of the war this had risen to two-thirds of a million tons and in 1959 had further increased to some 2.6 million tons a year.

Opening the symposium, Mr. Hutchison said no better occasion could be found than the present great concourse of chemical engineers for him to express on behalf of the chemical engineering profession their appreciation of all that Sir Alexander Fleck had done to advance chemical engineering. It was characteristic of Sir Alexander that having just reached a time when he could begin to enjoy a well-earned rest in his retirement, he had accepted the invitation to be present.

The symposium started from inquiries by A.B.C.M. and B.C.P.M.A., which emphasised that the field of distillation was one of the most important in which gaps existed in available knowledge. In order to limit the field and select a coherent body of information from the many papers offered, the organisers adopted the following principles. The subject matter was limited to fractional distillation in its theoretic and practical aspects. Laboratory distillation and gas absorption were excluded, except in so far as related to fractional distillation.

From the papers offered, 28 papers were selected from authors in 10 countries. Preprints were in the hands of those registering well in advance of the meeting, thus enabling authors to present their papers in brief and giving time for comprehensive discussion.

A resume was given on Friday by Mr. L. Holiday, chief technologist, Shell Chemical Co. Ltd., chairman of the A.B.C.M. and B.C.P.M.A. joint distillation panel.

Careers in Biochemistry

A new booklet just issued by the Biochemical Society, 135 Oxford Street, London W.1, describes educational and professional qualifications and training for careers in biochemistry, in addition to much other relevant data.

S.C.I. Annual Meeting in Bristol

SEVENTY-NINTH annual meeting of the Society of Chemical Industry will be held in Queen's Building, Bristol University, from Monday, 4 July to Saturday, 9 July. Annual meeting and presidential address by Mr. Ernest J. Solvay will take place on 5 July at 10.15 a.m., following a welcome by the Lord Mayor of Bristol.

Papers will be presented as follows: 6 July, 'Industrial aspects of fluorine chemistry', by Dr. A. K. Barbour (Imperial Smelting Corporation); 'A chemical approach to crop nutrition', by Dr. C. Bould (Long Ashton Research Station); Messel address by Lord Chandos; 7 July, 'Trialkyl phosphates, an example of process development', by C. H. G. Hands (Albright and Wilson); 'Metallurgical problems of the turbine engine', by E. R. Gadd (Bristol Siddeley Engines); 'Urethane foams—methods of production, properties and applications', by J. M. Buist, R. Hurd and Dr. A. Rowe (I.C.I. Plastics Division); 8 July, 'Modern aspects of polymers', by Dr. J. J. P. Staudinger (D.C.L. Plastics Division).

Works visits will include the following: S.W. Gas Board's Stapleton Road Works; Bristol and West Tar Distillers; John Hall and Sons; Fisons Fertilisers Ltd.; Berkeley Nuclear Power Station; Imperial Smelting Corporation; Permali Ltd.; Doran Instrument Co.; British Oil and Cake Mills; Erinoid Ltd.; Colthurst and Harding; Albright and Wilson; Long Ashton Research Station; Avon India Rubber; Bristol Brewery; Beechams Foods; Esso Petroleum, Fawley; Veterinary Research Station.

Social events will include a reception by the S.C.I. Bristol Section on 4 July; a lunch by the section on 5 July; a civic reception on 5 July; annual dinner of the society, on 6 July; a reception by Bristol University on 7 July; and a reception by Albright and Wilson on 8 July.

British Engineers' Handbook

The 1960 edition of the British Engineers' Association Classified Handbook of Members (608 pages) is now available. It includes a comprehensive list of members products classified alphabetically under more than 3,000 product headings. The classified index is repeated in French, German, Portuguese and Spanish. The handbook also includes an index of trade names and trade marks and is priced at 21s.

NEW U.S. ALKALI METAL PROCESSES UP-GRADE BENZENE, NAPHTHALENE

NEWS of two alkali metal processes aimed at up-grading benzene and naphthalene, was given at the recent Cleveland meeting of the American Chemical Society. They are: a sodium-potassium process to remove thiophene and carbon disulphide from coke oven benzene or benzene-toluene-xylene mixtures; and a sodium process to desulphurise coke-oven naphthalene. In this country a plant to produce pure benzene from coke-oven crude benzol is in hand by the joint Steel Company of Wales and Lincolnshire Chemical Company venture, the Port Talbot Chemical Co. (CHEMICAL AGE, 21 November, p. 321). Low sulphur nitration toluene, and xylene will also be produced.

At the A.C.S. meeting, Mr. F. Vancheri of M.S.A. Research said that his company's NaK-base process, now entering the pilot plant stage, should aid those coking plants which do not process enough coal to be able to afford the hydrogenation-extraction processes.

Investment is a $25,000 addition for the processing of up to 10,000 gall. a day; other costs are 0.9 cent or less per gallon. In the process, acid-washed benzene and NaK (56% K) alloy are fed continuously to a reactor containing 1 to 2% NaK in benzene at reflux. Ratio of NaK added to thiophene in the feed is 1.5:1. Benzene is distilled continuously as the feed is added, the hold-up time being 15 minutes. Thiophene is reduced from an input level of about 260 p.p.m. down to about 1.5 p.p.m.

As Dry as Possible

Both benzene and CS_2 should be as dry as possible because, as Mr. Vancheri pointed out, the use of a sodium-potassium alloy is an expensive way to remove water. NaK is much preferred to either sodium or potassium alone because it is liquid, thus dispersing more rapidly in the reaction mixture. Next step in the process is the building of a demonstration plant to get a more accurate picture of economics and to improve quality.

In view of the high cost of desulphurising naphthalene by hydrogenation, E.I. du Pont de Nemours have introduced a continuous sodium treating process with the 10 million-50 million lb. producer in mind. This process is based on a fine particle sodium dispersion; crude naphthalene with a melting range of 74°C to 78°C is the dispersing medium. The impurities are said to act as effective dispersing agents.

Three major steps in the process are dispersion, reaction and recovery. Firstly, liquid sodium is dispersed in crude naphthalene to make a 50-50 mixture. A high-shear dispersion unit agitates the mixture for 5-10 minutes before it is sent to a holding tank. The dispersion is then fed continuously into the main naphthalene feed stream which enters an evaporator (desulphurisation reactor).

Average product hold-up time in the evaporator is three hours. The three streams—incoming feed, vapourised naphthalene and side stream—are adjusted to keep a 50% residue-50% naphthalene mixture in the evaporator. Bottoms from this unit go to a second, smaller recovery evaporator. Operating on a semi-continuous basis, the second reactor strips the remaining naphthalene from the residue-naphthalene mix. When the residue comes close to filling the vessel, the feed stream is shut off and the vessel discharged.

Preliminary costing for a 30 million lb./year naphthalene plant gives a capital investment of about $100,000. Using 0.5 lb. of sodium for each 100 lb. of naphthalene, operating cost of the plant is about 0.37 cent per lb. This is based on desulphurising 78°C coke-oven naphthalene from a sulphur level of 6,000 p.p.m. to a level of 2,000 p.p.m. Increasing the amount of sodium to 2 lb. per 100 lb. of naphthalene will lead to less than 50 p.p.m. sulphur. Using the same facilities, the cost would be about 0.68 cent/lb. of desulphurised naphthalene.

Belco Demineralisation Plant Purifies Boiler Feed Water in New Zealand

DEMINERALISATION plant valued at about £20,000 has been installed by the Belco Division of Bogue Electric Manufacturing Co. of America to purify the boiler feed water of the Taswan Pulp and Paper Co. in New Zealand. Located at Auckland and drawing supplies from the Tarawera River near the mill site, for the steam supply and distribution system, the company was faced with the problem of purifying the river water which had an average mineral content of about 290 p.p.m. with a soluble silica content of 60 p.p.m.

The equipment supplied by Belco to overcome these difficulties was installed in a steam plant containing steam generators operating at 650 p.s.i. Due to the operating pressure of the boilers it was essential to reduce the raw water alkalinity to a minimum and remove soluble silica to a maximum of 4 p.p.m. The treating apparatus was designed to handle 120,000 lb./hour of feed water make-up.

The Belco plant, which under a recent agreement is now designed and manufactured outside the North American continent, by Head Wrightson Processes Ltd., is capable of ensuring a high quality of steam at a minimum of equipment maintenance. The treating equipment is a hot lime Belcolite system consisting of a 12 ft. diameter by 25 ft. straight hot process softener operating at 225°F. This unit reduces initial hardness in the water and removes bicarbonate alkalinity. Silica is removed to a maximum 4 p.p.m. by controlled addition of magnesium oxide and sludge recirculation. Automatic electrical controls achieve a sensitive balance between sludge retention and sludge blow off.

The chemical feed is pumped from tanks to the reactor vessel through proportioning valves; maintaining a constant feed rate per volume of raw water. Any turbid material carried over from the hot process softener is removed in a battery of non-siliceous filters. These pressure filters which receive the water from centrifugal booster pumps are 6½ ft. in diameter by 5 ft. long. Residual hardness is reduced by three hot sodium zeolite ion-exchanger units charged with Belcolite resin which produces a water of zero hardness. Brine for regenerating the Belcolite is pumped to the units from a volumetric concentrated brine tank.

Final treatment of the feed water is the removal of dissolved gases, oxygen, CO_2, etc. A Belco deaerator measuring 10½ ft. by 5 ft. long and storage tanks, provides a water containing zero p.p.m. free CO_2 and an oxygen content not in excess of .005 millilitre per litre.

The hot lime Belcolite system was chosen to make a reduction in effluent hardness, a decrease in chemical control sensitivity, a reduction in boiler internal treatment and reduced blow down. This system operates at high temperatures and chemical reactions are completed rapidly with low excess of reagents. This enables the size of equipment to be reduced and by employing lime, MgO and salt, operating costs are kept to a minimum.

Head Wrightson-Belco demineralisation plant and equipment are now installed in many parts of the world, on land, sea and in the air. An airborne demineraliser for jet aircraft was recently developed.

New Oil-gravel Product for Road Surfacing

A NEW type of road surfacing material, tested successfully by British Petroleum in Norway during the recent winter, consists of gravel mixed with 'road oil'—a material that resembles heavy fuel oil in appearance. The new product provides a low-cost surface for existing untreated roads that is said to remain flexible at very low temperatures, thus resisting frost damage.

Trial batches of oil were prepared at the B.P. group's Hamburg Refinery. The company is studying the possibilities of marketing this product in other European countries.

Overseas News

U.S. NO-CATALYST PROCESS PROVIDES NEW ROUTE TO PHTHALIC ACID

YIELDS of 85% can be obtained in a newly developed process for converting xylenes to free carboxylic acid, in which sulphur and water are the oxidants, with complete conversion to hydrocarbons, claim California Research, a subsidiary of Standard Oil of California. Success with this oxidant depends on avoiding direct interaction of sulphur with the organic compound. To avoid this, the organic compound is heated with a large excess of water before the compound can react appreciably with the sulphur. Predissolving the compound in water was reported by Dr. W. G. Toland of California Research at the recently held American Chemical Society national meeting, to be the most effective way; but the feed may also be added to a preheated mixture of sulphur and water.

Reaction takes from 15 minutes to two hours, between about 200° and 400°C. Dr. Toland said that one of the most surprising features of the oxidation was its reversibility. The reaction can be driven to completion by using excess oxidant or by removing one of the products. Sulphur dioxide for instance reacted with the hydrogen sulphide, driving the reaction to completion and generating more sulphur. It could be used as the sole oxidant in place of sulphur.

To produce phthalic acid, the reaction products are released before cooling, or sulphur dioxide can be used to form sulphur from the by-product hydrogen sulphide. The acid is recovered directly by recrystallising it from hot water after removing insoluble by-products. In the process, *o*-xylene is fed to an extractor to remove intermediates (*o*-toluic acid and thiophthalide); these are then further oxidised. So far the process has only been handled on a laboratory scale; if it is developed commercially the acid will be converted to phthalic anhydride and marketed.

India Abandons Soviet Plan for Synthetic Rubber Unit

The Indian Government has abandoned a proposal to establish a synthetic rubber plant in Hyderabad in collaboration with the Soviet Union. This project, referred to in CHEMICAL AGE, 2 April, p. 571, would have been the country's second synthetic rubber unit; the first is to be set up at Bareilly, U.P., with U.S. technical and financial aid.

New Acetaldehyde Plants Raise German Output 40-60,000 Tons

Wacker Chemie GmbH have just commissioned a plant at Cologne to make 20-30,000 tons a year of acetaldehyde. The process was developed by their subsidiary, Aldehyd GmbH, and produces acetaldehyde by direct oxidation of ethylene. Farbwerke Hoechst also commissioned a plant using the same process at the end of 1959, with the same capacity.

Discussions Start on Shipping Saharan Methane to Europe

Conch International Methane, the new subsidiary of Royal Dutch/Shell, Continental Oil, Houston, and Union Stockyards, Chicago, have started discussions with French oil interests on the export of Saharan natural gas to Europe by methane carriers. It is expected that output of the Hassi r'Mel natural gas will exceed the most optimistic forecasts and exports are expected to start at the end of 1962 or early in 1963. Methane ships will probably be used until a pipeline is laid.

New Czech Polyamide Fibre

The first Czech synthetic fibre plant was commissioned recently at Humenne in East Slovakia to produce a polyamide fibre "of the Perlon type", for textile purposes. Output is put at 1,180 tons a year. Production of fibres will start in 1961.

Formaldehyde in Formosa

Formaldehyde at the rate of 10 short tons a day is now being produced in Nationalist China by the Taiwan Plastic Corporation. The firm is using a $250,000 (U.S.) plant delivered to it recently by the formaldehyde plant specialist Karl Fischer, of West Berlin. This same German firm is at present working on the extension of the hitherto biggest 'perlon' synthetic fibre plant in the Soviet Union.

New Polio Vaccine

Merck Sharp and Dohme have applied for an NIH licence to make and sell their new polio vaccine which they say is more potent and uniform than the Salk material. Its high potency, due to a new purification process, ensures immunity, in most cases, with just two 0.5 ml. doses a few weeks apart.

Dutch Concern to Expand Polythene Plant

The State coal and chemical concern Staatsmijnen, of Limburg, Holland, to expand the capacity of their polythene plant and erect installations for the preparation of ethylene from mineral oil fractions. The oil is to be supplied to Staatsmijnen by the Esso subsidiary Esso-Nederland N.V. The Minister stated that the present ethylene plant using as starting material the company's own coke-oven gases was no longer producing sufficient quantities to permit the output of enough polythene.

German Firm Makes Polyester Paper

Paper made from polyester synthetic fibre, claimed to be the first dry-process synthetic paper ever made, was exhibited at the German Industries Fair at Hanover by the Weinheim West Germany, firm of Carl Freudenberg KG. Owing to its base material the paper is particularly strong and resistant to light and chemicals to a very high degree. Two types of synthetic paper were on show, one of them—type H7022—with a weight of 220g/cu. metre and the other—type H7116—weighing 160g/cu. metre. Production, starting this year, is at first to be at limited levels.

Pan-Am/Argentine Oil Pipeline Opened

The Pan American Argentina Oil Company have opened the oil pipeline running from Colonia Sarmiento to Caleta Córdoba, and passing through Cerro Dragón. The pipeline is 135 kms. long and has a carrying capacity of 3m. cubic metres of petroleum annually. This work was undertaken entirely by the contracting company and expenditure amounted to U.S. $6 million.

Butadiene Unit in Japan On Stream

A 25,000 tons-a-year Houdry dehydrogenation process unit to produce butadiene, principal ingredient in synthetic rubber, has gone on stream at the Japan Synthetic Rubber Co. Ltd., in Yokkaichi.

For Houdry Process Corporation, a leading process licensor and manufacturer of catalysts and chemicals for the petroleum and petrochemical industries, it is the second of three Houdry-licensed foreign units of this type to start up. A unit is in operation at Marl, West Germany, while another is nearing completion at Ravenna, Italy, while seven dehydrogenation units are operating at five plant locations in the U.S.

Agfo Polythene Plant to be Built in U.S.

Scientific Design Co., Inc., New York, have been awarded a contract to engineer, design, and construct a polythene plant for Foster Grant Company, Inc., the first in the U.S. to utilise the Agfo process. SD, an independent engineering company are exclusive licensors and contractors for the Agfo process in a large number of countries.

The Agfo process was developed by Imhico A.G., Switzerland, which is directed by Dr. Karl Heinz Imhausen, well known in world chemical circles. A large polythene plant utilising the process and licensed directly by Imhico is now under construction in the U.S.S.R.

Allied to Make New Group of Fluoro-carbon Plastics

Allied Chemical of the U.S. have doubled facilities for making melamine and urea moulding compounds. Full-

scale production of 90 million lb. will probably not be reached until the late 1960's.

A 50% expansion of capacity for anhydrous hydrofluoric acid at Nitro, W. Va., is also announced. The company recently acquired additional reserves of more than 1 million tons of fluorspar. In addition a new plant has been authorised at Baton Rouge, La., to manufacture a new group of fluorcarbon plastics.

The first product planned is a non-flammable thermoplastic material based on chlorotrifluoroethylene. It is characterised by high heat- and chemical-resistance, good electrical properties, low moisture absorption and high transparency. It can be fabricated by injection, extrusion and other moulding techniques. Film made from the polymer has high impermeability to moisture vapour and to many common gases. It is said to retain useful properties over a range of temperatures from that of liquid air to nearly 400°F.

Allied Chemical International expect that the new polymer will be available for export early in 1961.

Portable Power Supply for Military Evaluation

A portable fuel cell power supply, developed by General Electric for the U.S. Marine Corps. and the Army, is designed to operate at full load for 2,000 hours without maintenance. The 30-lb. unit consisting of 30 ion-membrane fuel cells, puts out 200 watts of 24-volt direct current for 14 hours on a single fuel charge. The fuel is metal hydride which yields the hydrogen used by the cells together with oxygen from the air. The hydride, in re-usable, sealed containers, can be replaced without interrupting operation.

Work Starts on New Greek £14 Million Fertiliser Plant

Work has just started on the construction of a new nitrogenous fertiliser plant in Ptolemais, north west Greece. To cost about £14.6 million, the plant should be completed in the spring of 1962. Daily output will be 800 tons of nitrogen fertilisers. Construction is being handled by German and Italian engineering firms.

Liberalised Imports to Spain Includes Chemicals

The list of goods that may freely be imported from certain countries abroad into Spain includes various chemicals, calcined alumina, paints and varnishes, casein and vegetable oils. The list has been issued by the Direccion General de Comercio Exterior of the Ministry of Commerce.

Substantial increases have been made in the Customs duties on nitrogen fertilisers to protect the domestic industry against dumping.

Large Brazilian Chemical Plant with French Assistance

The Brazilian Cia. de Superfosfatos e Produtos Químicos will establish a plant in Sapuava with an initial annual output of 40,000 tons of triple superphosphates of calcium of 45-48% in powder or granulated form. The factory will also be able to produce 150 tons and 40 tons daily of sulphuric and phosphoric acid, respectively. Design and technical assistance will be supplied by the French group, Etablissements Kuhlmann, of Paris, who were responsible 10 years ago for the establishment of the existing plants for the manufacture of sulphuric acid (120 tons daily) and calcium superphosphate (60,000 tons annually).

Phosphates Plant under Construction in Morocco

A plant is at present being built at Safi, Morocco, for the production of triple superphosphates and sulphuric acid. By 1962 some 200,000 tonnes of superphosphates annually will be turned out by the factory, a venture of the Moroccan Bureau d'Etudes et de Participation Industrielle and the Office Chérifien des Phosphates. Further chemical projects in the kingdom include the Samir oil refinery in Mohammedia, work on which will be commenced this June, and a Unilever plan for a cleansing media works at Ain Sebaa, a suburb of Casablanca.

Phenol Company Formed in the Argentine

The semi-State Argentine chemical concern Atanor has, together with Hooker Chemical Corporation of Niagara Falls, formed a company to manufacture 25 tonnes of phenol daily in an Argentine installation. Investment in the scheme is to total 480 million pesos, and a credit of $2 million (U.S.) is to be applied for as partial financing of the project from the American-based Export-Import Bank. The German producers Farbenfabriken Bayer set up a similar company jointly with the Bunge and Born concern some years ago but phenol production met with such difficulties, owing to trouble with consumers and the Government of the country that the plant had to close.

Ciba Plant in Argentina

Ciba Ltd. of Basle intend to erect a factory in the Argentine for the manufacture of chemicals used in the textile and leather manufacturing industries, and Sola Ltd. of Geneva propose to invest $13 million in a soda works to be erected in Patagonia by Cia. Industrial de Alcalis S.A.

German Company Produces More Synthetic Rubber

With the opening soon of their fourth processing stream, the German synthetic rubber producers Bunawerke Hüls GmbH, of Marl, will increase their annual capacity to 120,000 metric tons/year. This recent statement was accompanied by the news that the plant's production programme, which at present includes six types, is to be further expanded by the introduction in the future of new types now still being tested. When Bunawerke starts with the production of carbon-black rubber towards the end of the current year, it will, as the biggest synthetic rubber producer in Europe, turn out all normal grades of 'cold' rubber.

Methacrylates from Rumania

A plant for the production of methacrylates, including polymethylmethacrylates, is reported to have been brought into operation at the Nicolae Teclu chemical plant in Rumania.

U.S. Companies Prepare for Competition in Antiknock and Antifreeze Chemicals

WHEN supply is sufficient, Standard Oil of California hope to use tetramethyl lead exclusively as an antiknock agent. Already the company is adding TML with tetraethyl lead to all grades of petrol. The Ethyl Corporation, Baton Rouge, who supply Standard Oil with TML will have a large-scale plant available later this year (CHEMICAL AGE, 30 April, p. 724).

California Research, a Standard Oil subsidiary, who have done much experimental work with tetramethyl lead believe that it will eventually approach the cost of TEL and that all major petrol producers will eventually use TML to replace a large portion if not all of the TEL now used. The value of TML increases as octane numbers are raised and as the aromatic content of petrols is increased.

E.I. du Pont de Nemours also have a TML unit now under construction at Deepwater Point, N.J., and this too will be on stream this year. This autumn they will also be competing strongly with Dow Chemical, Midland, Mich., in antifreeze solutions. Both Du Pont and Dow have new antifreeze products which are to be launched for the next winter trade (*Chem. and Eng. News*, 25 April, p. 42).

Dowgard, with an ethylene glycol base, a balanced inhibitor system and deionised water, is described as Dow's most ambitious entry into the consumer goods field. Du Pont say their sales promotion programme for Telar (ethylene glycol base, an inhibitor system and a colour check indicator to warn of contamination) is the largest the company has ever used to introduce a consumer product.

Dow claim that their product can be used for a full year without the usual spring and autumn changeover; Du Pont state that their combined antifreeze and antirust coolant never needs to be drained from properly operating cooling systems. Price of the Du Pont's Telar will be $5 a gallon, enough for the average car; Dowgard will cost $8 to $12 for most cars, filling the cooling system.

The U.S. antifreeze market is said to be worth $300 million a year.

Power-Gas and U.S. Firm To Form Joint Company for Chemical Plant Erection

PARSONS POWERGAS, with headquarters in London, is a new joint enterprise by the Ralph M. Parsons Co., engineers-constructors, Los Angeles, and P.G. Engineering Ltd., a member of the Power-Gas Group. Complete engineering and construction of petroleum, petrochemical, and related plants will be carried out by Parsons Powergas, backed by the combined resources and experience of the parent companies.

Initially, activities will be concentrated in the Commonwealth. The two firms will each appoint three men to a committee which will direct the new enterprise. Parsons have named vice-presidents Mr. Harry Broom and Mr. Robert V. Peaslee and Mr. Ahmet Neyzi, European operations manager, to the committee. Mr. R. W. Rutherford, managing director of P.G. Engineering, has been appointed to the committee and names of the other two members will be announced shortly. Mr. Peaslee will be general manager of Parsons Powergas.

Facilities of the world-wide chain of offices maintained by Parsons and P.G. Engineering are available to the new organisation.

Dewrance Equipment On Show in London

A DISPLAY of equipment by Dewrance and Co. Ltd., Great Dover Street, London S.E.1, was seen in London on the occasion of the company's 1960 international sales conference by some 500 clients, who were welcomed by Mr. J. M. Storey, C.B.E. On show was the Microsen process control, and electronic device for controlling processes in the oil and petrochemical industries. It was developed by the company's U.S. associates, Manning, Maxwell and Moore Inc, who earlier this year sold their interest to Robertshaw-Fulton Controls Co., a firm that will develop the control at a plant in Anaheim, Cal.

Also on show was a redesigned range of bronze valves and water gauges now being marketed at attractive prices. Other exhibits included brazing powders for the jet engine and missile field; an electrical sequential controller, the Asco solenoid valve, and an electrical valve actuator which, redesigned in order to meet competition, is said to embody unique features.

Standard Disinfectants Form Two New Companies

Two new associate companies have been formed by Standard Disinfectants Co. Ltd., 23 Sloane Street, London S.W.1.

S.D.C. Pesticides Ltd. will sell all kinds of formulations for pest destruction; while Preservation Developments Ltd. will deal with protection of timber from damage by pests and disease. Illustrated brochures are available from Standard Disinfectants providing fuller details of the services.

DURGAPUR TAR DISTILLATION PLANT READY FOR OPERATION

NEWS that the sulphate of ammonia plant at Durgapur steelworks has gone on stream (see previous issue of CHEMICAL AGE, page 713) has been rapidly followed up by completion of the tar distillation plant, which when in full production will distil 230 tons a day of crude tar. This will come from the coke oven by-products plant, to produce pitch, creosote, road tar, preservative creosote, naphthalene and benzol.

The crude tar will be passed successively through heat exchangers and a distillation column which seperates the pitch from the other oils. The process employed is Chemical Engineering Wiltons' continuous tar distillation.

In the blending plant pitch and creosote oil will be blended into pitch creosote for use as fuel in the steel making plant. This plant can also produce road tar and preservative creosote for preserving wood which will be available for sale. Facilities are provided for road tar to be loaded to road or rail tankers for the purpose of commercial distribution.

This plant is part of the integrated steelworks being built for Hindustan Steel Ltd. by Iscon, the British consortium of 13 leading engineering and electrical companies engaged in the construction of the steelworks at Durgapur, West Bengal, India.

Rosenblad Heat Exchangers in U.K.

THE B.B.A. Rosenblad plate heat exchanger, sales of which are handled in the U.K. by British Boiler Accessories Ltd., 62/3 Fenchurch Street, London E.C.3, are at present imported from Sweden, but part manufacture will start shortly in this country. This equipment is said to have many advantages due to a unique plate design, whereby high pressures up to 210 p.s.i. can be used on the standard unit. Of herringbone shape, this design is also said to ensure the highest possible heat transfer coefficient for plate type heat exchangers.

It can be supplied in most materials including stainless steel, Monel, titanium and hard lead. Joints are made up from an extruded rectangular nitrile rubber which obviates moulding of the joints and leads to an economical price.

The Rosenblad heat exchanger has been designed with particular reference to the chemical and manufacturing industries, rather than the milk industry.

In addition to these heat exchangers, B.B.A. will undertake the supply and part manufacture of the remainder of the Rosenblad range, excluding the Rosenblad spiral, which is already manufactured in the U.K. by another company. The B.B.A. heat exchanger service will include the B.B.A. helical tube exchanger.

C.J.B. Introduce New Lab. Design Service

SERVICES of the laboratory engineering department of the C.J.B. Automatic Control Division have now been extended to all industries, state Constructors John Brown Ltd., Eastbourne Terrace, London W.2. The department has gained experience over a wide field in designing and installing process laboratories on C.J.B. projects. Supported by the resources of the Automatic Control Division, this experience enables the department to offer a service of complete responsibility from initial consultancy to final commissioning, of "any laboratory in any type of industry".

The service covers architectural and technical design, selection and purchasing of equipment and installation—all sections of the service can be supplied together or separately to meet the requirement of clients. It is pointed out that since C.J.B. do not manufacture instruments, this specialist consultancy service is able to select from the full range of equipment offered by manufacturers those components best suited to meet the control conditions sought.

Details of the service can be obtained from Mr. J. D. Ambrose, C.J.B. Laboratory Engineering Department, Leatherhead (telephone Leatherhead 4400). See also 'Distillates', p. 761.

Veale Report Published

A report on the training of radiological health and safety specialists, 'Training in Radiological Health and Safety: Report of a Committee appointed by the U.K. Atomic Energy Authority,' is now available from the Stationery Office, price 5s 6d. This committee under the chairmanship of Sir Douglas Veale was set up to consider the national need for specialists to deal with the health and safety aspects of the use of ionising radiations and radioactive substances.

Cobalt in Agriculture

A completely revised edition of 'The Application of Cobalt in Agriculture', has been released by the Mond Nickel Co. Ltd., Thames House, Millbank, London S.W.1. It illustrates the necessity of cobalt within the soil for prevention of deficiency diseases which face livestock in the U.K. as well as other countries, and also describes various methods of overcoming cobalt deficiency, including modern techniques such as administering heavy pills or 'bullets' to diseased animals.

In Parliament

Only 18 Out of 160 Crop Protection Chemicals are Covered by Regulations

IT is encouraging that manufacturers were continuing, and intensifying, their efforts to produce more and more of the non-toxic type of chemical for spraying which would be safe both for workers and for wild life. This was stated by Mr. J. B. Godber, Joint Parliamentary Secretary to the Ministry of Agriculture, in a recent debate in the House on poisonous substances.

Mr. Frederick Willey (Sunderland North) had moved, "That an humble address be presented to Her Majesty, praying that the Agriculture (Poisonous Substances) (Extension) Order, 1960 (S.I. 1960, No. 398) dated 10 March, 1960 . . . be annulled." Mr. Godber explained that "The parent Act to this Order, the Agriculture (Poisonous Substances) Act, 1952, gives to my right hon. Friends the Minister and the Secretary of State power to make regulations to protect workers in agriculture against risks of poisoning arising from the use of certain substances. The Act specifies two groups of chemicals, first, dinitrophenols, dinitro-substituted phenols and their salts, and, second, organo-phosphorus compounds . . . We have the extension Orders dealing with organo-mercury compounds, arsenical compounds, fluoroacetic acid and its derivatives, and endrin . . . The Order we are discussing now consolidates the previous extension Orders and extends the Act to cover the particular group of chemicals which has been referred to, namely; '*Substances the molecular structure of which consists of a bridged six-membered ring with substitutents in the ring*'."

Mr. Godber then stated that the group to which he had referred includes endrin, which is already regulated, and it will also include endothal and its salts. "It is possible that other new crop protection products in this group will be developed and marketed and we are trying to provide them. Where necessary, regulations will be made under the Act to require workers to wear protective clothing and to take proper precautions when using chemicals in this group . . . Regulations have been made for only 18 substances out of the 160 crop protection chemicals available for use in this country."

At the termination of Mr. Godber's reply Mr. Willey thanked the Parliamentary Secretary for assurances that he would keep the matter under constant review. He thereupon withdrew his motion.

7-Substitution of Theophylline

IN a technical bulletin on theophylline —well known for its diuretic and caridovascular effects—Huffer and Smith Ltd., the fine chemical division of C. F. Gerhardt Ltd., state that hydrolysis of sodium theophylline in aqueous solution to such an extent that the solution is too alkaline for use, can be overcome by buffering in theophylline and sodium acetate.

If the salt of an organic instead of an inorganic base is used the effect of the hydrolysis is less serious. The most widely used salt is that with ethylenediamine. Theophylline - ethylenediamine, known as aminophylline, although not excessively alkaline still has an undesirable alkalinity. It appeared, however, that in general the specific medicinal properties of theophylline are not grossly altered by 7-substitution.

One interesting derivative produced by the company is theophylline-7-acetic acid, which although less soluble than theophylline and more strongly acid, can form very soluble salts that are much more nearly neutral than aminophylline. It is even possible by using certain di-acidic bases to obtain mixtures of mono- and di-salts which, while intensely soluble, can give solutions with pH below 7.

Huffer and Smith, of New Era Works, Purley Way, Croydon, in line with their general policy, do not produce proprietary or ethical preparations based on the theophylline compound. They are willing to undertake exclusive manufacture should some other purine chemical be of interest.

Anti-dumping Duty on Ammonia Sulphate Not Needed

The Board of Trade announce that the German and Belgian manufacturers of ammonium sulphate who, it was established, had been responsible for dumping the material in the U.K., have now agreed to raise their export prices forthwith. In view of this the B.o.T. are taking no further action in the matter of an anti-dumping duty.

No decision, however, has yet been reached on the application for the removal of the protective duty which the Board have under consideration.

C.J.B. Chemical Engineering Scholarships

Constructors John Brown Ltd. have entered into an agreement with the Institution of Chemical Engineers for the award of two scholarships. The purpose is to encourage research in chemical engineering, particularly in chemical plant design. Scholarships are tenable at any U.K. educational institution in receipt of grants from the University Grants Committee and having a Department of Chemical Engineering under the direction of a professor of chemical engineering.

Cumene Hydroperoxide Now Available from D.C.L.

CUMENE hydroperoxide is now available for sale in commercial quantities from the Chemical Division, the Distillers Company Ltd., Devonshire House, Mayfair Place, London W.1, who are selling agents for British Hydrocarbon Chemicals Ltd. Deliveries can be made in 5-gall. polythene containers or in 45-gall. polythene-lined drums from stock at Grangemouth.

Typical of the group of organic compounds to which it belongs, cumene hydroperoxide can be used as an intermediate in a variety of chemical syntheses. Sample quantities for evaluation, technical literature and price quotations are available from the D.C.L. Chemical Division.

Cumene hydroperoxide can be used as a polymerisation initiator and catalyst. In the polymerisation of vinyl-type monomers, it is said to be superior to other organic peroxides because of the wide temperature range (100°C to −10°C) over which it is effective. As a solution in organic solvents, or as the sodium salt in aqueous solution, it can be used either in homogeneous or in two-phase polymerisation. An example of this latter is in redox systems, such as the emulsion polymerisation or co-polymerisation of vinyl or diene monomers. Cumene hydroperoxide also finds application as a catalyst for curing polyester resins.

B.H.G. Acquisition will Extend Chemical Range

ACQUISITION of the whole of the share capital of Colloids Inc., Newark, N.J., by Barrow Hepburn and Gale Ltd., will extend the range of products manufactured at Beverley, Yorks, by their subsidiary Richard Hodgson and Sons Ltd., and will facilitate the pooling of research resources and development of other products for the chemical industry.

For some years Colloids Inc. have specialised in a range of products of interest to the chemical, rubber and plastics industries and for two years some of these products have been produced by Richard Hodgson and Sons under licence. Among products now being manufactured is a range of foam control agents that function both for anti-foaming and defoaming. They have been developed for use in the degassing, stripping and concentrating of synthetic latices; Drawax 930S for instance, is used in the production of styrene/butadiene rubbers and Bevaloid defoamers 581B and 619 have applications in adhesives, coatings, paper, pharmaceuticals, paints, chemical processing and in cleaning compounds.

Memorial Service to Mr. E. J. Boake

A memorial service for Mr. Edmond Johnson Boake, who died on 17 March at the age of 91, was held recently at the Church of St. Mary-le-Bow, Cheapside, London E.C.4. He was chairman of A. Boake Roberts and Co. from 1926 until his retirement in 1952.

PEOPLE in the news

● **Mr. F. A. Jackman,** assistant managing director of Carless, Capel and Leonard Ltd., has been appointed president of the National Benzole and Allied Products Association. Vice-president is **Mr. W. E. Cartwright,** Benzole Producers Ltd.

Mr. Jackman, who has been with Carless, Capel and Leonard since 1928, took his degree in chemistry at London University. In recent years his particular interest has been in work on specifications, in which connection he has been a member of several committees of the B.S.I. and other bodies.

● **Mr. F. Malcolm Stevenson** was elected president of the Society of Dyers and Colourists, succeeding **Mr. John Boulton** who had served as president for the past two years, at the annual general meeting held in Leeds on 29 April. President-elect, unanimously agreed, was **Mr. R. J. Hannay, Mr. L. Morton Wood** was unanimously re-elected as hon. secretary, and **Mr. A. Waddington** unanimously re-elected as hon. treasurer. **Mr. G. S. J. White,** it was announced, had been elected as vice-president, and ordinary members of council, **Dr. C. B. Stevens, Professor R. H. Peters, Dr. Giles** and **Mr. R. K. Fourness.**

● **Mr. F. A. S. Wood,** who has been elected chairman of the Croda Organisation Ltd., Cowick Hall, Snaith, Goole, Yorks, is a graduate of Clare College, Cambridge. A son of A. P. Wood, managing director of Croda Ltd. from 1925 to 1949 and a great-nephew of both G. W. Crowe, chairman from 1925 to 1954, and Sir Edward Crowe, K.C.M.G., chairman from 1954 to 1960, Mr. Wood served with the Fleet Air Arm from 1944 to 1947. He has worked in all departments of the company, becoming sales director in 1950. He spent 1951 and 1952 in New York forming Croda Inc. and was elected managing director of Croda Ltd. in 1953.

F. A. S. Wood

N. A. Iliff

● **Mr. N. A. Iliff** will become managing director of Shell Chemical Co. Ltd. on 31 May in succession to **Mr. L. H. Williams,** managing director since 1955. Mr. Williams is to take up a new executive appointment in International Chemical Co. After the war, Mr. Iliff returned to Cambridge where he was a King's College lecturer in chemistry. In 1948 he joined Shell Petroleum's chemical planning group and in 1950 spent a year working in Shell chemical plants in the U.S. In 1951 he returned to the U.K. and formed a long range planning group for chemicals. From 1955 to 1958 he was with Deutsche Shell, first as chemical adviser and then as manager of the chemical industry group. He returned to the U.K. in 1958 for special organisational duties in Chemical Industry Administration. In 1959 he joined Shell International Chemical as regional co-ordinator (U.K., Caribbean, Central and South America, liaison with North America).

● **Mr. J. B. Doyle** has been appointed head of I.C.I. central safety department in succession to **Mr. H. R. Payne,** who is retiring on 30 April after 32 years' service in I.C.I. Mr. Doyle has been deputy works manager of the Avenue Works, Alkali Division, since 1954. A graduate of Cambridge University, he joined the I.C.I. Alkali Group in 1934.

● **Mr. H. Hadden, Jr.,** vice-president and general manager of the Overseas Division, Chemstrand Corporation, has now been appointed a director. He is also secretary to the Corporation.

● **Professor G. B. Kistiakowsky,** professor of Chemistry, Harvard University, distinguished for his work in chemical kinetics of gaseous reactions, photochemistry, thermochemistry and the structure of polyatomic molecules, has been elected a foreign member of the Royal Society.

● **Mr. Bryan Topley, M.A., F.R.I.C.,** director of development of Albright and Wilson Ltd., 1 Knightsbridge Green, London S.W.1, has been appointed deputy chairman. He joined the company in 1936 and was appointed a director in 1944.

● **Mr. J. G. Mighell,** sales manager of Mandoval Ltd. (under management of the Rio Tinto mining group) left the U.K. last week-end on an extensive sales and development tour of Mediterranean and Middle East countries.

● **Mr. Henry S. Wingate,** president of the International Nickel Co. of Canada Ltd., since 1954, and a director since 1942, has been elected chairman of the board and chief officer of the company. **J. Roy Gordon** has been elected president, succeeding Mr. Wingate. Mr. Gordon has been executive vice-president since 1957, and a director since 1953.

● The officers and group committee of the S.C.I. Surface Activity Group appointed to serve for 1960-61 have been named as follows: chairman, **Sir Eric Rideal, M.B.E., F.R.I.C., F.R.S.,** hon. treasurer, **R. C. Tarring, B.Sc., A.R.C.S., D.I.C.** (Shell Chemical Co. Ltd.), hon. recorder, **F. Riley** (Marchon Products Ltd.), hon. secretary, **M. K. Schwitzer, M.I.Chem.E.** (Armour Hess Chemicals Ltd.). The group committee is constituted: R. J. Cole, M. G. Fleming, A. F. Kertess, R. H. Marriott, A. C. Monkhouse, C. D. Moore, K. G. A. Pankhurst, Conmar Robinson, L. N. Savidge, R. C. M. Smith, G. H. Twigg, H. K. Whalley.

Membership and other details can be obtained from either Mr. M. K. Schwitzer, Armour Hess Chemicals Ltd., 4 Chiswell Street, London E.C.1, or Mr. F. Riley, Marchon Products Ltd., 140 Park Lane, London W.1.

Queen Elizabeth the Queen Mother, Chancellor of London University, opened the new School of Pharmacy building in Brunswick Square, Bloomsbury, last week. The Queen Mother is chatting to the Dean of the School, Professor W. H. Linnell, and chairman of the School council, Sir Harry Jephcott

● **Dr. M. H. B. Stiddard, B.Sc., Ph.D.,** has been appointed lecturer in chemistry at Hull University, from 1 October.

● **Mr. F. Drake Parker** has been appointed managing director and **Mr. Douglas H. Carter,** director and general manager of McKee Head Wrightson Ltd. Mr. Parker was formerly vice president of the U.S. company Arthur G. McKee, and Mr. Carter was director and general manager of Head Wrightson Processes Ltd.

● **Dr. J. Bell, B.Sc., Ph.D.,** manager of the I.C.I. Nobel Division silicones department since May 1957, has been appointed to the division board in succession to **Mr. F. B. Wrightson, B.Sc.,** engineering and technical director, who retired on 30 April. Dr. Bell, who is 50, joined I.C.I's research department at Stevens-

(Continued on page 778)

Radiochemical Centre Opens Two New Labs at Amersham

TWO new laboratories, part of a programme of technical development at the Radiochemical Centre of the U.K. Atomic Energy Authority, Amersham, were opened last Wednesday by Sir Cyril Hinshelwood, O.M., president of the Royal Society, in the presence of Sir William Penny and a number of distinguished guests.

The new facilities, an organic laboratory with an area of 15,000 sq. ft., and the Alpha Laboratory (for work with natural radioelements), will enable the Centre to meet the rapidly growing demand for radioactive products.

Amersham, which is the only organisation of its kind in the world producing a comprehensive range of radioactive materials, sending 60% of its consignments overseas, 35% for research in the U.K., and the remainder to industry, has increased production since 1957 by some 75%.

The laboratory buildings, designed by E. D. Jefferies Mathews, O.B.E., F.R.I.B.A., and constructed by Jesse Mead Ltd., of Chesham, completed in a little over 20 months at a cost of £278,000, have a total floor area of 30,000 sq. ft.

The two buildings serve distinct purposes which have called for quite different layouts, though they are similar in structure. The two units are joined by a central plant room at first-floor level which provides common services, and each is planned for future extension. Both are artificially ventilated by air ducts carried within roof and floor spaces, and have separate drainage systems dealing with radioactive effluent.

The Organic Laboratory is designed for chemical and biological work on carbon-14 and tritium, and thus no heavy screening is necessary, while their facilities are similar to those of conventional organic chemical laboratory.

The technical requirements of the Alpha Laboratory, for work with radium and other highly toxic materials, must meet the needs of rigorous containment, with heavy screening and the most advanced methods of remote handling. Its centrepiece is a block of four 'hot' benches screened with 3 ft. to 4 ft. of concrete and up to 10 in. of lead. Each bench is 50 ft. long and accommodates a system of communicating reaction boxes viewed through lead glass windows up to 18 in. thick. Here a remote-controlled miniature electric railway runs within the boxes for transportation of radioactive materials. The boxes are constructed of glass-reinforced polyester resin and coated with a strippable lacquer.

The purpose of the Organic Department is to provide a supply of labelled compounds for the many research workers using radioactive tracer methods in science, medicine and industry—and it is interesting to note that export and home market consignment figures show British industry to lag behind some other highly industrialised countries in the employment of radioisotopes.

Although carbon-14 is the most important isotope for tracer work, the demand for labelled compounds containing other isotopes has greatly increased. Cobalt-60 is now being produced on a very large scale, rising to several millions of curies a year, to meet the requirements of world industry for processing materials by gamma radiation.

The Radiochemical Centre is an establishment of the Research Group of the U.K.A.E.A., under the general direction of Dr. B. F. J. Schonfield, C.B.E., F.R.S. The Centre employs about 300 people at Amersham, and 50 at Harwell.

Fluoroacetamide, an Historical Note

IN various publications from this* and other laboratories, the statement is made or inferred that fluoroacetamide was first prepared in 1948 **(1, 2)**; this has been found to be incorrect.

In fact, fluoroacetamide was first prepared by Swarts in 1896 **(3, 4)** presumably from the methyl and ethyl ester and ammonia (since fluoroacetyl chloride is not referred to); the m.p. given as 102° now corrected by Swarts to 108° **(5)** in 1906. The m.p. of the pure mixture has been found to be 108.5° con.) and its solubility in water at room temperature is approximately 15% w/v. This amide was used by Saunders **(2)** as an analytical standard for organofluorine compounds of similar chemical structure.

As with another amide, sulphanilamide, first obtained in 1908 by Gelmo, and now manufactured in considerable quantity, the biological properties of fluoroacetamide, in this case, its insecticide properties, have remained unknown for a considerable time and were discovered by accident.

REFERENCES
1. Phillips & Worden *J. Sc. Fd. Ag.* 1957, **8**, 653-656.
2. Buckle, Heap and Saunders *J. Chem. Soc.* 1949, 914.
3. Swarts, BI (3) **15**, 1,134 (1896).
4. Saunders "Phosphorus & Fluorine, The Chemistry & Toxic action of their organic compounds." Camb. Univ. Press 1957.
5. C 1906 II 1567; & footnote, P.423.

* Dr. M. A. Phillips and Associates, Romford, Essex.

Copper Sulphate Output

Output of copper sulphate in the U.K. in February was 1,559 long tons, according to the latest returns of The British Bureau of Non-ferrous Metal Statistics. The total for the two months ended 29 February was 3,223 compared with 6,796 in 1959.

Dissolver Available on Loan for Practical Tests

A MOREHOUSE mill and a Cowles dissolver can now be supplied on loan to firms wishing to study their productive capacity from Durham Raw Materials Ltd., 1-4 Great Tower Street, London E.C.3, who last summer were appointed U.K. selling agents for Morehouse International, Los Angeles. Two similar machines have been installed in the company's laboratory at Birtley, Co. Durham, where they are at the disposal of customers seeking immediate development facilities.

A feature of the Cowles dissolver is its patented impeller, the vanes of which impart an extremely high velocity to the material and create a zone of intense turbulence immediately surrounding the impeller. During dispersion, hydraulic attrition breaks down solids to ultimate dry particle size and surrounds each particle with a film of liquid. As a dissolver, the impeller fractures friable materials, shreds soft ones and strips away softened material to expose new layers to solvent action. As an emulsifier, it is said to reduce the dispersed phase to minute particles surrounded by the continuous phase, readily and with a minimum of aeration.

Batch sizes can vary up to 6,000 gall., but depend on viscosity and nature of material being processed.

In the Morehouse mill, grinding is carried out between two special grinding stones, one of which is rotated at speeds up to 9,800 r.p.m. The distance between the stones is micrometer-adjustable from positive contact to about ¼ in. in steps of .001 in. Adjustments can be made during operation, and the mill can be locked in position.

Reducing Fire Risks During Welding Operations

The services section of the I.C.I. Billingham Engineering Works has designed a welding box to catch sparks during arc-welding operations, and shield the welder's arc. The opening of the box is as small as is practicable to admit the burning nozzle, for preparing the ends of the metal, and the electrode for welding. What little arc flash escapes from the box is largely screened by the body of the welder, who stands slightly to one side, and his mate, who holds a cloth screen. In the I.C.I factories the method is used for welding in close proximity to plants where there is a fire risk.

Electrochemical Analysis

Automatic analysis by electrochemical methods is the subject to be considered at a meeting of the Polarographic Society at the Royal College of Science, Kensington, S.W.7, at 7 p.m. on 25 May. A colour film, "Oscillographic Polarography," will follow three papers to be given by D. R. Chapman of the research and development division of Baird and Tatlock (London) Ltd., P. H. Crumley (Evershed and Vignoles Ltd., research and development laboratories) and A. L. J. Buckle (Technicon Instruments).

Commercial News

- **Controlling Interest Acquired in Brit. Benzol**
- **1-for-4 Scrip Issue by Horace Cory**
- **20% Rise in Evans Medical Group Earnings**
- **I.C.I.-ALCOA Acquire Almin Group**

B.D.H. (Ireland)

British Drug Houses Ltd. state that their new subsidiary, B.D.H. (Ireland) Ltd., is in the process of formation and has not yet been formed as previously stated (see CHEMICAL AGE. 30 April, p. 726).

J. Bibby & Sons

Chairman of J. Bibby and Sons, Mr. H. P. Bibby, in his annual review, said there had been little change in market conditions for lecithin and sales were fairly stable. Sales of fatty acids had risen but highly competitive prices absorbed the profit margins at the start of the year; towards the year-end there was a trend towards higher prices and better margins. There had been a small increase in the profit on monoglycerides due to higher turnover.

Thomas Bolton and Sons

Selling prices of copper sulphate had improved due to a number of changes in the circumstances governing the trade said Mr. F. Waine, chairman of Thomas Bolton and Sons Ltd. in his annual report. Those more satisfactory results were only reflected to a very limited extent in the 1959 accounts, but the deterioration in regard to copper sulphate, referred to in the previous annual statement, had been halted.

British Benzol

Aberforth Holdings, an investment company, have acquired a controlling interest in British Benzol and Coal Distillation and J. S. Darwen and Co., boards and paper manufacturers, for £1,236,430. British Benzol have an issued capital of 250,000 units of £1 of which 231,960 have been purchased for £695,880, while 2,800,880 Ordinary 2s shares of Darwen (3.6 m. in issue) have been acquired for £540,550. Net assets of British Benzol totalled £664,270, and those of Darwen amounted to £513,849.

New chairman of the company, Dr. Jur. J. H. Rappaport, pointed out that on the basis of current earnings the two companies should produce an income to Aberforth, before tax and depreciation, of no less than £175,000 in a full year. This, he says, is a very substantial increase on the net annual profit which could have been expected from the company's properties which these acquisitions will replace.

Horace Cory

Proposals to make a one-for-four scrip issue in ordinary shares and the issue of a maximum of £40,000 5% convertible redeemable debentures (convertible after the capitalisation issue into a maximum of 160,000 ordinary shares) are to be put at the annual meeting of Horace Cory and Co. Ltd. on 10 June. The debenture issue is against loans from H. Kohnstamm and Co., New York, under a proposed agreement for an exchange of know-how and licence to produce and sell their special range of food, drug and cosmetic colours.

Distribution is raised from 22½% to 30%, with a dividend of 25% and a bonus of 5%. Net profit for 1959, after all charges including tax of £21,588 (£17,857) was £23,692 (£14,097).

Evans Medical

About half of the improvement in group earnings in 1959 of Evans Medical Ltd., which rose by 20% from £331,341 to £397,896, was due to larger sales, the remainder from improved productivity and efficiency, said Mr. I. V. L. Fergusson, chairman, in his annual statement. Increased efficiency more than made good reductions in margins in 1959, which Mr. Fergusson regarded as "the most satisfactory feature of a successful year's operations".

While home sales rose satisfactorily, overseas markets enjoyed the larger proportionate growth. The immediate outlook justified the expectation of being able to report further satisfactory trading results in 1960.

Net profit after tax was £235,496 (£188,768). Group capital spending on contracts amounted to about £85,250 (£69,350).

A new virus unit under construction for the production of tissue culture vaccines was expected to come into production this year. No earnings from the projects could be expected before 1961.

Hickson and Welch

Increase in the interim dividend from 4% to 8% for the year ending 30 September 1960 reflects, state Hickson and Welch (Holdings), both increased trading during the first six months of the year and the board's decision to reduce the disparity between dividends. Final last year was 12%.

I.C.I.-ALCOA

I.C.I. have acquired control of Almin Ltd., parent company of Associated Light Metal Industries, both on their own behalf and on behalf of the Aluminium Co. of America. An offer from the two companies has been accepted by more than 90% of Almin shareholders and is now unconditional. Assets of Almin total about £5 million. I.C.I. and ALCOA last September formed Imperial Aluminium Co., of whose capital I.C.I. hold 51% and ALCOA 49%. Imperial Aluminium have also recently acquired the Invicta Foil Co., and the Rigid Aluminium Division of Prestige Group.

The Almin Group comprises International Alloys, Soutern Forge, Warwick Production, Pressoturn and Aero Controls. It also includes the Fulmer Research Institute, an independent organisation for sponsored research.

Newton Chambers and Co.

An offer by Newton Chambers and Co., Thorncliffe, Sheffield, for the capital of Ronuk Ltd., has been recommended for acceptance by Ronuk directors.

Saint-Gobain

Cie. de Saint-Gobain, Paris, report for the financial year 1959 a turnover of N.Fr.920 million (N.Fr.793 million), a net profit of N.Fr.65 million (N.Fr.52 million). The company is proposing a dividend of 7.33% (12%), dividend payment is up from N.Fr.166,930,000 to N.Fr.376 million.

Sasol

Dr. F. J. Du Toit, chairman of Sasol (South African Oil and Gas Corporation), said recently that a net profit would be shown this year for the first time since the start of production in 1954. Output is now at an annual rate of 40 million gall. or 10% of the country's consumption. Turnover had increased to an annual rate of £8 million.

Texas Butadiene

A plan is announced in New York by which the two U.S. chemical firms Industrial Rayon Corporation and Texas Butadiene and Chemical Corporation would merge. This fusion would be by the conversion of all ordinary and preference shares of Texas Butadiene and Chemical into 1,687,298 ordinary shares of the former concern. This would result in the raising of Industrial Rayon ordinary shares to a new total of 3,538,553 units. Last year the two concerns had a combined turnover of over $100 million.

U.S. Borax and Chemical

U.S. operating company of Borax (Holdings), the U.S. Borax and Chemical Corporation state that net income after tax for the three months ended 31 March was $1,842,012 ($1,546,065), earnings per common share were 40c. (33c.). Net income for the six months ended 31 March were 71c. per common share (55c.). For the six months period sales reached a record $32.6 million, an increase of 10% over the same period of 1959. Outlook for borax, potash and 20 Mule Team products is said to be "generally encouraging."

INCREASE OF CAPITAL

AMASAL LTD. (formerly Mangers Chemical Company Ltd.), 1 Martin Street, Stafford. Increased by £65,000, beyond the registered capital of £185,000.

TRADE NOTES

Chemical-resistant Clothing

All types of chemical-resistant clothing in nylon-based p.v.c. will soon be available from James North and Sons Ltd., Kirkman House, 54A Tottenham Court Road, London W.1. The company will also supply Northylon covers, salvage sheets and tarpaulins.

Changes of Address

Precision Components (Barnet) Ltd., have changed their address to Kabi Works, Cranbourne Road, Potters Bar, Middlesex. Telephone: Potters Bar 3444.

On 2 May, the head office of Proban Ltd. was moved from its previous address in Royal Exchange, Manchester, to larger offices at 34 Princess Street, Manchester 1 (Central 8093/4).

New Selective Weedkiller

Weedone LV 4, a new selective weedkiller distributed by E. W. Nickerson and Sons Ltd., is an oil-based emulsion effective against weeds not killed by the normal type MCPA. The weedkiller is manufactured by A. H. Marks, of Wyke, Bradford, under license from the U.S. company, Amchem Products Incorporated. It has the added attraction of being non-poisonous and is sold in one-acre packs which reduce wastage.

Isceon Fire Extinguishants

A brochure is available from the Consolidated Zinc Corporation Ltd., 37 Dover Street, London W.1, which describes additions to the company's sales range of Isceon fluorine chemicals. These are Isceon 13B1—bromotrifluoromethane ($CBrF_3$); and Isceon 12B2— dibromodifluoromethane (CBr_2F_2), which are fire extinguishants of the vaporising liquid type, particularly suitable for suppression of fires involving liquid hydrocarbon fuels.

Rotary Pelleting Press

The Manesty RS2 rotary pelleting press is now available in six models from Manesty Machines Ltd., Speke, Liverpool. Three of the models are fitted with spring operated overload release for pellets up to 1⅛ in, 1⅞ in, and 2½ in diameter, and three with pneumatic overload release. Other features of these models are given in a leaflet available from the company.

Coumarone Resins

A new technical bulletin (153/R/60) from the Anchor Chemical Co. Ltd., Manchester 11, entitled 'Coumarone resins in rubber compounding,' describes the manufacture, general properties and utilisation of coumarone resins.

U.K. Sales of Molasses

All U.K. sales of molasses formerly handled by Stratton Chemicals Ltd. as agents for Williams and Co., Genferstrasse 11, Zurich 2, will in future be transferred to the newly formed company, Williams Alcohol and Molasses Co. Ltd. This company will operate temporarily from 17 Stratton Street, London W.1, pending completion of new offices at 8-10 Hallam Street, W.1. Mr. M. P. P. Reardon, formerly executive director of Stratton Chemicals, has been appointed managing director of Williams Alcohol and Molasses Co. Ltd.

Sales of ethyl alcohol in the U.K. realised in conjunction with Williams and Co., will continue to be handled by Stratton Chemicals, through their wholly-owned subsidiary, Chemitrade Ltd.

Plastics Fabrication

A new brochure covering the company's services in industrial plastics fabrication is available from Tough Plastics Ltd., Wey Lock Works, Byfleet Road, New Haw, Weybridge, Surrey.

Simon-Carves Ltd.

Steelmaking and electro-precipitation are described in a new brochure available from Simon-Carves Ltd., Cheadle Heath, Stockport. The publication includes data on open-hearth furnaces; converters; electric-arc furnaces and sinter plant.

Mechanical Handling

Booklets on the Collis truck and other mechanical equipment are available from J. Collis and Sons Ltd., Regent Square, Gray's Inn Road, London W.C.1.

Change of Name

Medway Paper Sacks Ltd., Larkfield, near Maidstone, Kent, have changed their name to Reed Medway Sacks Ltd.

Anti-slip Additives

Aluminium hydrate, now introduced by Bush, Bead and Segner Bayley Ltd., Marlow House, Lloyd's Avenue, London E.C.3, is said to show some promise as an anti-slip additive for polishes. Specification is 65% Al_2O_3; 34.5% loss on ignition; 0.3% Na_2O; 0.5% adsorption water; pH value of the aqueous suspension is 7.5; bulk density is 400-500 g. per litre; average particle size is 0.35 micron.

Dutch Agents for Reddish

Sole manufacturing and distributive rights for the whole of the range of products of the Reddish Chemical Co. Ltd. and Reddish Detergents Ltd., have been given to Fait-Oil N.V., Delden, Holland. Reddish Chemical manufacture detergents for the dairy, brewing and soft drinks industry, and Reddish Detergents, a subsidiary, are concerned with detergents for the catering, food and other industries.

Wet Air—Dry Air

A publication with the above title, on the subject of dry compressed air and gases, is available from Buurnet and Lewis Ltd., Redhouse Industrial Estate, Aldridge, Walsall, Staffs.

Diversey Hygiene Division

Diversey (U.K.) Ltd., whose products are distributed by Deosan Ltd., 42-46 Weymouth Street, London W.1, have formed a new Hygiene Division, which will provide a unique kitchen hygiene service for establishments. Two new items of equipment will be handled. They are an electronic device for automatically dispensing detergent to dishwashing machines and for constantly controlling the strength of the solution, and a device to dispense automatically Serospot additive to the rinse tanks of dishwashing machines.

Aluminium Silicate

I.C.I. Metals Division has recently brought up to date and reprinted its standard booklet on Fortafil A70 (aluminium silicate), copies of which are available from the company.

Market Reports

HOME MOVEMENT FULLY MAINTAINED

LONDON An active demand for industrial chemicals has again been reported. The movement to the home consuming industries has been fully maintained at about the level of recent weeks, and the volume of inquiry for export has been satisfactory, and spread over most sections of the market.

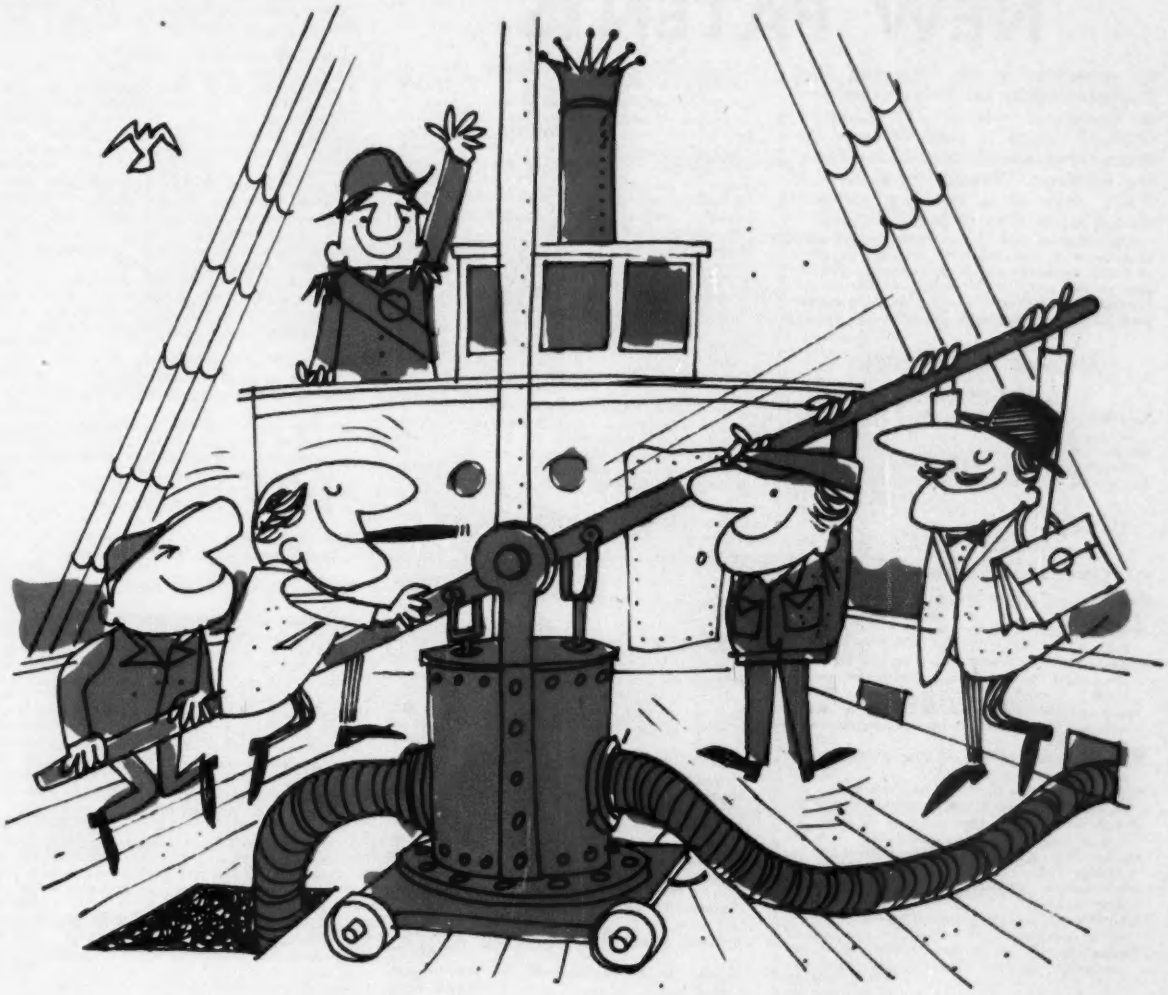
The price basis is steady with quotations unchanged. Among the non-ferrous metal compounds, zinc dust is dearer, the super fine quality being quoted at £142 a ton for quantities of two tons or more.

Demand for fertilisers is running at a high level and prices are well held. Buying interest in coal tar products has included cresylic acid, the creosote oils and naphthalene, while a moderate demand for pitch has been reported.

MANCHESTER Trade in the alkalis and other leading heavy chemical products has kept up at a satisfactory level and a fair number of additional home and shipping enquiries have been circulating. These have covered a wide range of products. In addition, contract commitments are being drawn against steadily by the textile bleaching, dyeing and finishing trades and other industrial outlets. Prices generally maintain a steady undertone. Among the tar products, carbolic and cresylic acids, creosote oil and the naphthalenes are in demand.

SCOTLAND Demands continue fairly active for general chemicals in most sections of the Scottish heavy chemical market, and have applied to quite a wide range. Inquiries have been numerous and here again these have been varied. Activity in the agricultural trade is still being maintained with a good volume of business taking place. For the most part there is little alteration in prices to report, except those pertaining to metal derivatives.

Quite an interest has been shown during the past week in regard to imports, with little alteration in the export market.



All hands to the pump

DCL
BISOL

Production, sales and transport—at DCL all work together at the pumps primed for prompt delivery of Bisol industrial chemicals.

The DCL organisation covers the country. It provides a service as reliable as wide experience, careful planning and devoted work can make it. Rush orders or regular supplies—you can depend on the DCL service to deliver the goods on time. Try it.

SOLVENTS, PLASTICISERS & INTERMEDIATES

THE DISTILLERS COMPANY LIMITED · CHEMICAL DIVISION
Bisol Sales Office, Devonshire House, Piccadilly, London W.1. Tel: Mayfair 8867

NEW PATENTS

By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

AMENDED SPECIFICATIONS

On Sale 1 June

Separating aromatic hydrocarbons. Dow Chemical Co. **718 909**
Organic compounds containing halogen and phosphorous. Ciba Ltd. **744 360 & 747 824**
Vitamin K_1 intermediates. Merck & Co. Inc. **768 650 & 768 651**

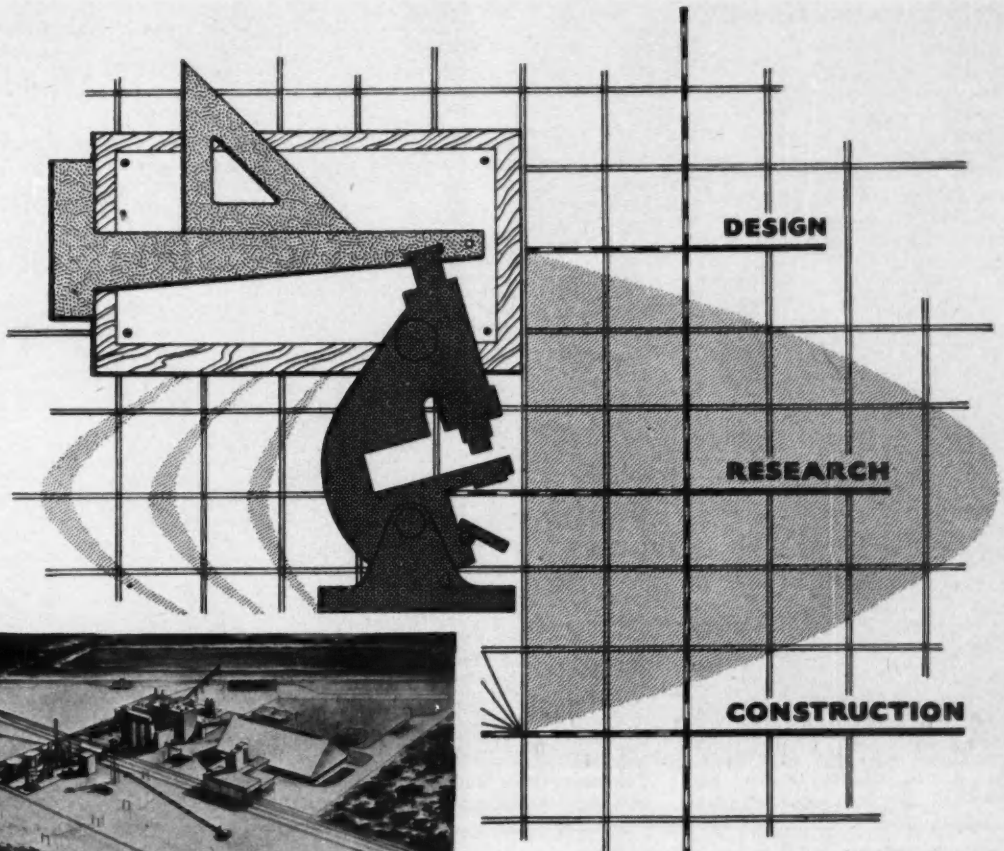
ACCEPTANCES

Open to public inspection 9 June

Separation of steroid mixtures. Glaxo Laboratories Ltd. **837 019**
Vinyl polymers. Yarsley Research Laboratories Ltd. **836 841**
Organic zinc compounds and a process for these compounds with organic aluminium monohalides. Ziegler, K. **836 734**
Accellerating sedimentation of solids in turbid aqueous liquids. Badische Anilin- & Soda Fabrik AG. **837 224**
Processes for ceramic bodies. U.K. Atomic Energy Authority. **837 023**
Dyestuff of the perylene tetracarboxylic acid series. Farbwerke Hoechst. **837 326 & 837 327**
Process of preparing alkyl esters of pyridine carboxylic acids. Aries Associates Inc. **836 905**
Methacrylate polymers. Imperial Chemical Industries Ltd. **837 227**
Polymerisation process. Imperial Chemical Industries Ltd. **836 736**
1,1-Dimethyl-2,2-di-(1-cyanoethyl)hydrazine. American Cyanamid Co. **837 229**
Production of unsaturated hydrocarbons and methanol. Imperial Chemical Industries Ltd. **836 909**
Polymerisation of olefins. Sun Oil Co. **837 026**
Process for the production of sulphur dioxide from sulphates. Farbenfabriken Bayer AG. **837 027**
Heterocyclo compounds and process. Ciba Ltd. **836 738**
Coumarin derivatives and their production. Farbenfabriken Bayer AG. **836 749**
Mono- and polyphthalidyl ethers. Dow Chemical Co. **836 567**
Decontamination of plutonium-aluminium alloy. Atomic Energy of Canada. **836 916**
Polymerisation of olefins. Esso Research & Engineering Co. **836 633**
Production of hydrogen. Texaco Development Corporation. **837 030**
Pigment compositions comprising the head salt of tetrabromofluorescein. Sterling Drug Inc. **836 921**
Preparation of aliphatic monocarboxylic alkyls. Esso Research & Engineering Co. **837 118**
Preparation of pure aluminium alkyls. Esso Research & Engineering Co. **837 119**
Monoazo dyestuffs containing dihalogenotriazinyl. Imperial Chemical Industries Ltd. **837 035**
Trimerisation of organic isocyanates. Imperial Chemical Industries Ltd. **837 120**
Copper-containing triazine monoazo dyestuffs. Imperial Chemical Industries Ltd. **837 124**
Manufacture of alkali metal aluminium fluorides. Kaiser Aluminum & Chemical Corp. **836 928**
Polymerisation catalysts. Imperial Chemical Industries Ltd. **836 642**
Production of organophosphorus compounds. Metal & Thermit Corporation. **837 329**
Method for the preparation of methyl 2-ketogluconate. Miles Laboratories Inc. **836 847**
2,3,dichloro-2-butene-1,4-dithioacetic acid. Uclaf. **836 644**
Phthalocyanine compounds. Imperial Chemical Industries Ltd. **836 647**
Sulphurisation of metals. Badische Anilin- & Soda-Fabrik AG. **837 331**
Substituted dicarboxylic acid esters. Imperial Chemical Industries Ltd. **836 849**
Removal of sulphur from metals. Union Carbide Corporation. **836 648**
Polymerisation processes. Due Pont De Nemours & Co., E.I. **837 041**
Method for production of metallic uranium or uranium alloys. Centro Informazioni Studi Esperienze S.r.L., C.I.S.E. **837 042**
Manufacture of liquid nitric acid esters of aliphatic polyhydric alcohols. Hercules Powder Co. **837 044**
Organic bromides. Whiffen & Sons Ltd. **836 653**
Phenolic amino compounds. Monsanto Chemicals Ltd. **836 934**
Over-polymers of chloroprene on polystyrene. Distillers Co. Ltd. **837 334**
Over-polymers of styrene on polychloroprene. Distillers Co. Ltd. **837 335**
Water-soluble phosphorus derivatives of saturated or unsaturated compounds of the pregnane series. Veermehren, T. L. M. **836 654**
Ion sources for mass spectrometers. U.K. Atomic Energy Authority. **837 140**
Phosphorus-containing pyridyl alkanol esters. Ruhrchemie AG. **836 655**
Pyrimidinylazobenzene derivatives and their production. Takeda Pharmaceutical Industries Ltd. **837 337**
Solid foamed resins. Napier & Son Ltd., D. **837 339**
Production of tetracycline. American Cyanamid Co. **836 657**
Liquid-level gauges for vessels containing liquid and vapour at high temperature and pressure. Babcock & Wilcox Co. **837 343**
Preparation of steroid compounds. Glaxo Laboratories Ltd. **837 049**
Process of preparing an iron oxide-chromium oxide mixture. Soc. Des Couleurs De Provence. **836 936**
Stabilised hydrocarbon polymeric materials. Western Electric Co. Inc. **836 664**
Production of chloroprene. Distillers Co. Ltd. **836 666**
Process for the generation of a fuel gas of high calorific value. Texaco Development Corporation. **836 940**
Process for gramicidin S. Ciba Ltd. **836 726**
Low pressure catalytic polymerisation and processes for catalysts. Petrochemicals Ltd. **837 053**
Cyclones. Imperial Chemical Industries Ltd. **837 157**
Means for the transportation of low temperature liquids. Constock Liquid Methane Corp. **836 667**
Vulcanisation accelerators. Farbenfabriken Bayer AG. **837 159**
Organo-aluminium compounds and method of preparing them. Du Pont De Nemours & Co., E.I. **836 949**
Dyestuffs of the anthraquinone series. Imperial Chemical Industries Ltd. **836 671**
Process for catalytic hydrogenation of aromatic amino compounds. Abbott Laboratories. **836 951**
Urea compositions. Imperial Chemical Industries Ltd. **837 163**
Polymeric material comprising low pressure Ziegler polyolefins. Petrochemicals Ltd. **837 164**
Polymerisation process. Imperial Chemical Indust ies Ltd. **836 741**
Method for producing polyesters in a dry form. Onderzoekingsintituut Research NV. **836 742**
Polytetrafluoroethylene products and method for production. [Divided out of 837 198.] **837 199**
Process for organosilicon polymers. Midland Silicones Ltd. **836 954**
Preparation of N:N-disubstituted melamines. British Oxygen Research & Development Ltd. **837 167**
Carboxylalkyl derivatives of *N*-dodecyl propylenediamine. Goldschmidt AG., T. **836 956**
Catalyst suspensions. Bataafsche Petroleum Maatschappij NV., De. **837 054**
Apparatus for treating bulk material with hot gases. Simon-Carves Ltd. **837 175**
Antibacterial compositions and method for producing same. Parke, Davis & Co. **836 958**
Preparation of spiramycins II and III. Soc. Des Usines Chimiques Rhone-Poulenc. **836 743**
Production of ammonium nitrate. Atlas Powder Co. **836 852**
Catalytic polymerisation of olefines and to catalysts therefor. Petrochemicals Ltd. **837 055**
Manufacture of polyolefins. Petrochemicals Ltd. **837 064**
Olefine polymerisation processes. Petrochemicals Ltd. **837 251**
Resolution of alkali metal amalgams and the extraction of refractory metals. Ethyl Corporation. **837 067**
Felt-like polytetrafluoroethylene products and their production. Du Pont De Nemours & Co., E.I. **836 678**
Imidazole derivatives and processes. Soc. Des Usines Chimiques Rhone-Poulenc **836 854**
Soap compositions containing urea. U.S. Borax & Chemical Corp. **837 069**
Magnesium containing organic compositions and process. Continental Oil Co. **836 855**
Manufacture of caprolactam. Du Pont De Nemours & Co., E.I. **837 070**
Process for dispersing calcium carbonate in a non-volatile carrier. Continental Oil Co. **836 856**
Derivatives of para-amino-salicylic acid. Canadian Patents & Development Ltd. **837 071**
Phosphonic acid ester fluorides. Farbenfabriken Bayer AG. **837 073**
Steroidal compounds and compositions and preparation thereof. Upjohn Co. **836 747**
Terephthaloylamino acids, their salts and esters, and processes. Eprora AG. **836 748**
Process of automatic control for pulverised coal gasification. Sumitomo Chemical Co. Ltd. **837 074**
Tris (alkylamino) boranes and method of producing same. U.S. Borax & Chemical Corp. **837 076**
Process for silane. Du Pont De Nemours & Co., E.I. **836 865**
Apparatus for mixing liquids of different temperatures. A'Beckett, W. J. **837 263**
Process for uranium tetrafluoride. Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. **837 083**
Process of sulphonating alkaryl hydrocarbons. Continental Oil Co. **837 084**
Substituted tetrahydropyridines and process. Lilly & Co., E. **836 753**
Aromatic amides of trialkoxybenzoic acids. Bristol Laboratories Inc. **837 266**
Polymers. Goodrich Co., B. F. **836 755**
3,5-diido-4-pyridone-N-acetic acid esters and their preparation. Farbenfabriken Bayer AG. **836 960**
Process for polyene aldehydes. Hoffmann-La Roche & Co. AG, F. **836 961**
3-amino-thiophene-2-carboxylic acids and the esters thereof and a process. Farbwerke Hoechst AG. **837 086**
Purification of sodium. Du Pont De Nemours & Co., E.I. **837 268**
Process for 2-methyl-1-butene. Continental Oil Co. **837 088**
γ-cyclohexylcrotonaldehyde. Soc. Des Usines Chimiques Rhone-Poulenc. **836 759**
Method for hydrolysis of starch. Separator AB. **836 764**
Steroids and manufacture thereof. Upjohn Co. [Divided out of 836 971.] **836 972, 836 973 & 836 974**
Purification of vinyl chloride. Solvay Et Cie. **836 970**
Process and apparatus for refining crude naphthalene. Soc. Pour l'Exploitation Des Procedes Ab-Der-Holden. **837 295**
Pyrimidinylazobenzene derivatives and their production. Takeda Pharmaceutical Industries Ltd. **837 338**

Open to public inspection 15 June

Process for production of water enriched in deuterium oxide. Urey, H. C. **837 730**
Manufacture of polymers in acqueous dispersion. Vinyl Products Ltd. **837 542**
Electrolysers for the decomposition of water. Lonza Electric & Chemical Works Ltd. **837 864**
Electrolysers. Lonza Electric & Chemical Works Ltd. **837 865 & 837 866**
Method of producing products containing antibodies. Petersen, W. E., and Campbell, B. **837 695**
Flame-retardent unsaturated polyester resin compositions. Spence & Sons Ltd., P. **837 696**
Multitray clarification apparatus. Dorr-Oliver Inc. **837 595**
Method for dispersion of pigments in acrylonitrile polymer solutions. Chemstrand Corp. **837 697**
Amino-containing vinyl sulphides. Rohm & Haas Co. **837 802**
Production of heavy water. Junta De Energia Nuclear. **837 894**
Process for nitrogenous synthetic cation-exchange resins. Farbenfabrik Wolfen Veb. **837 599**



DORR-OLIVER COMPANY LIMITED

is the British section of a world-wide organization specializing in the design and manufacture of plant and equipment for all processes where the separation of fine solids from liquids is required.

Consult with us on your problems concerning —

AGITATION
CLASSIFICATION
CLARIFICATION
THICKENING
VACUUM AND PRESSURE FILTRATION
EFFLUENT PURIFICATION
SAND AND ACID PUMPING
FLUIDIZED BED SYSTEMS
MIXING, ETC.

For information write to :

Dorr-Oliver Company Limited, Norfolk House, Wellesley Road, Croydon, Surrey

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

People in the News

(*Continued from page 771*)

ton in 1936. During the second world war he worked in the acids department at Ardeer, and in 1946 was a member of an I.C.I. mission to the U.S. On his return he joined the operating department, in which he became an assistant manager in 1953. In January 1954, became an assistant works manager of Ardeer, a post he held until taking charge of the silicones project. Mr. Wrightson, who has been chief engineer and director of Nobel Division since 1952, first joined the company in 1929 at the Huddersfield works.

● **Mr. A. R. G. Williams,** managing director of National Adhesives Ltd., Slough, has been elected president of the Adhesives Manufacturers' Association.

● **Mr. C. G. Childs, M.Sc., A.R.I.C.,** technical manager of Bowmans Chemicals Ltd., Moss Bank, Widnes, has been appointed a director.

● **Dr. R. H. Dodd,** managing director of Chemical Construction (G.B.) Ltd., has been elected to the council of the British Chemical Plant Manufacturers' Association.

● **Mr. Leslie Pate** has been appointed sales co-ordinator for Canada by Q.V.F. Ltd., Stoke-on-Trent.

● **Mr. A. E. Martin,** Padley and Venables Ltd., has been appointed president of the British Compressed Air Society for the 1960/61 year. Vice-president is **Lt.-Col. K. Reavell,** of Reavell and Co. Ltd.; hon. technical director is **Mr. T. C. Hore,** Holman Bros. Ltd.; hon. publicity officer is **Mr. H. S. Parsons,** Consolidated Pneumatic Tool Co. Ltd.

● **Mr. H. W. Palmer,** managing director of Glaxo Laboratories Ltd., has been elected president of the Association of British Pharmaceutical Industry for 1960-61. **Dr. D. E. Wheeler,** managing director, the Wellcome Foundation Ltd., was elected vice-president, and **Mr. G. T. Morson, M.C.,** was re-elected hon. treasurer.

H. W. Palmer

● **Mr. G. F. A. Burgess,** a managing director of the British Metal Corporation, who left London on 25 April on a visit to Canada and the U.S. as chairman of the International Tin Research Council, will visit the Tin Research Institute at Columbus, Ohio. While in Columbus, he will have conferences with the manager of the office, **Mr. R. MacIntosh,** and **Dr. W. E. Hoare,** assistant director of the Tin Research Institute, Greenford, Middx, who is at present visiting a number of important tinplate and can-making centres in the U.S. and Canada.

● **Mr. T. T. Randall Davies,** overseas market manager of Evans Medical Ltd., has left by air for a visit to South America and the Caribbean. **Mr. P. J. Wheen** has also left for a visit to the West Indies and Central America.

DIARY DATES

MONDAY 9 MAY

C.S.—Durham: Science Labs., South Rd., 5 p.m. 'Electrode processes involving transition ions', by N. S. Hush.

TUESDAY 10 MAY

Inst. Plant Eng.—Manchester: Engineers' Club, Albert Sq., 7.15 p.m. 'Application of new materials to plant engineering', by J. Leyland.

Soc. Instrument Tech.—Manchester: Manchester Room, Central Library, St. Peter's Sq., 6.45 p.m. Manchester Section a.g.m., & 'Instruments in pharmaceutical research,' by Dr. J. W. Black.

WEDNESDAY 11 MAY

Plastics Inst.—Cardiff: Angel Hotel, 6.30 p.m. South Wales Section a.g.m.

S.C.I.—London: 14 Belgrave Sq., S.W.1., 6.15 p.m. Food Group a.g.m. & 'Changes in dietary fats in the past 100 years', by Prof. T. P. Hilditch.

THURSDAY 12 MAY

S.A.C.—Nottingham: Gas Showrooms, 7 p.m. 'Applications of g.l.c. to analysis of essential oils', by D. Holness.

FRIDAY 13 MAY

S.A.C.—Hull: Meeting on 'Corrosion'.

ACCESSIBILITY

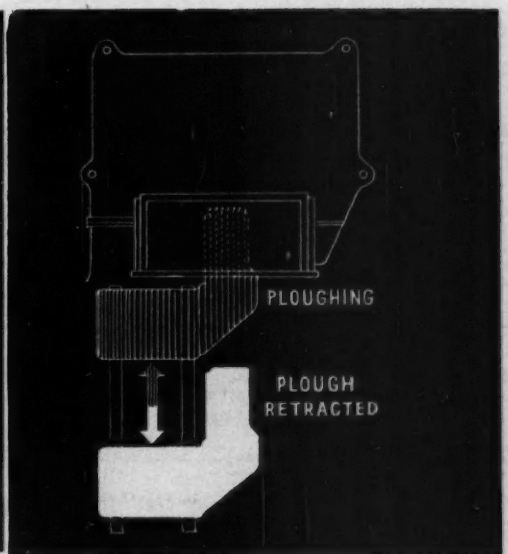
has received special consideration when designing the new BROADBENT TYPE 80 Ploughing Centrifuge.

Large covers are incorporated for basket inspection, and the complete plough head is hydraulically retracted for replacing basket linings and changing plough blades.

The centrifuge can be opened as illustrated in 5 minutes without disturbing the feed and wash pipe lines.

THOMAS BROADBENT & SONS LTD
CENTRAL IRONWORKS HUDDERSFIELD
PHONE 5520-5

ref. B5



CLASSIFIED ADVERTISEMENTS

CLASSIFIED RATES: All sections 5d. per word. Minimum 8/-. Three or more insertions 4d. per word. Box Number 2/- extra.

SEMI-DISPLAY: 30/- per inch. Three or more insertions 25/- per inch.

EDUCATIONAL

A.M.I.CHEM.E.—More than one-third of the successful candidates since 1944 have been trained by T.I.G.B. All seeking quick promotion in the Chemical and Allied Industries should send for the T.I.G.B. Prospectus. 100 pages of expert advice, details of Guaranteed Home Study Courses for A.M.I.Chem.E., B.Sc.Eng., A.M.I.Mech.E., A.M.I.Prod.E., C. & G., etc., and a wide range of Diploma Courses in most branches of Engineering. Send for your copy today—**FREE**. T.I.G.B. (Dept. 84), 29 Wright's Lane, London, W.8.

BRADFORD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CHEMICAL TECHNOLOGY
A SPECIAL SHORT COURSE
on
"THE USES OF PLASTICS AND POLYMERS IN CHEMICAL ENGINEERING"
will be held on
Friday, June 17th and Saturday, June 18th 1960

The course is designed to present to chemical engineers and others the chemistry and properties of plastics and high polymers in relation to their uses in chemical engineering and applications of polymers and plastics in chemical plant, heat insulation and high temperature uses.

Fee for the course: £2 5. 0.

Programme and further particulars can be obtained from the **Registrar, Bradford Institute of Technology, Great Horton Road, Bradford, 7.**

FOR SALE

CHARCOAL, ANIMAL AND VEGETABLE, Horticultural burning, filtering, disinfecting, medicinal. Also lumps, ground and granulated. **THOMAS HILL-JONES, INVICTA WORKS, BOW COMMON LANE, LONDON, E.3 (TELEPHONE: EAST 3285).**

MANUFACTURING FACILITIES

INDUSTRIAL SITES suitable Chemical Works. Rail and Dock. Large area for waste products. East Coast Port Southern Ireland. **Box No. 3707 Chemical Age.**

PATENTS & TRADE MARKS

The proprietor of British Patents Nos. 741704 and 767777, entitled "MEDICATED FEED COMPOSITIONS" and "COMPOSITION FOR COMBATING TRICHURIS INFECTION OF MAMMALS". offers same for license or otherwise to ensure practical working in Gt. Britain. Inquiries to Singer, Stern & Carlberg, 140 South Dearborn St., Chicago 3, Illinois, U.S.A.

PLANT AND MACHINERY FOR SALE

20 GALLON Stainless lined Double 'Z' Mixer with Jacketted Pan. Another similar but not stainless. Lying at our No. 2 Depot, Willow Tree Works, Swallowfield, Berks. Apply Winkworth Machinery Limited, 65 High Street, Staines, Middx.

PHONE 55298 STAINES

850 gall. **Stainless Steel** Enc. Cyl. Tank.
40 gall. S.S. Jac. Pans (Four).
Alum. Tanks 1,000, 1,500, & 2,000 galls.
Glassed Lined Tanks 800 up to 10,000 galls.
(Two) 2,000 gall. Jac. Cyl. Mixers 9 ft. by 6 ft. 8 in. diam. 60 W.P.
(Three) Heavy 'Z' Blade Jac. Mixers 4 ft. 5 in. by 3 ft. 8 in. by 3 ft. deep.
'Worssam' Jac. Glanded Fin Blade Mixer 33 in. by 33 in. by 26 in.
Sectional Tanks 8,400, 6,400, & 4,800 galls.

Send for Stock Lists

HARRY H. GARDAM & CO. LTD.,
100 CHURCH STREET, STAINES

Mild Steel Vertical Jacketed Pan, 48 in. I.D. by 54 in. deep, heavy domed cover plate 2 in. thick slotted for 1¼ in. Lock Bolts. Suitable for Vulcanising, Tested Hydraulic 100 lb. PSI. Price £120 0s. 0d. Ex stores.

THOMPSON & SON (MILLWALL) LTD.,
MILLWALL, LONDON, E.14. Tel.: East 1844

Classified Advertisements can be accepted up to 10 a.m. Tuesday for insertion the same week.

BOX NUMBERS: *Reply c/o "Chemical Age" · Bouverie House · Fleet Street EC4.*

PLANT AND MACHINERY FOR SALE: continued

STAINLESS STEEL CONTAINERS
from 1 gallon up to 24 gallons.
MOBILE SALES COMPANY,
101/3, Brixton Hill,
London, S.W.2.
TUL. 0121 (4 lines)

Three Lead lined **STEEL TANKS**, 14,000 galls., 9 ft. diam. by 35 ft. long.
Three Lead lined **STEEL TANKS**, 9,500 galls., 13 ft. 6 in. diam. by 10 ft. high.
Two **NICKEL SILVER TANKS**, 6,750 galls., 8 ft. diam. by 23 ft. 3 in.
Brand New **COCHRAN** Vertical and **ECONOMIC** Self-contained **STEAM BOILERS** in stock, also all sizes reconditioned and guaranteed. List on request.
STAINLESS STEEL TANKS, PANS, CONDENSERS, PLATES, VALVES AND COCKS. Very wide selection.
FRED WATKINS (ENGINEERING) LTD.,
COLEFORD, GLOS.
Phone: Coleford 2271/2.

VACUUM OVENS by Francis Shaw 5 ft. 2 in. wide by 8 ft. 9 in. deep by 7 ft. high containing 15 1½ in. thick platens. In excellent condition. Reply **Box No. 3708, Chemical Age.**

PUBLIC APPOINTMENTS

MINISTRY OF POWER, HQ., London, require Temp. Experimental Officer, pref. under 31. Duties—abstracting scientific articles: preparation of surveys of current literature, briefs and memoranda on fuel and power subjects. Min. Quals. H.N.C. or Inter. B.Sc. or equiv. Some knowledge of terms used in fields of fuel and power, ability to translate French and German essential; knowledge of Russian an advantage. Salary £1,005—£1,233 (men), £985—£1,203 (women). Five day week. Prospects of Establishment. Forms from Ministry of Labour, Technical and Scientific Register (K), 26 King Street, London, S.W.1, quoting A.196/0A.

SCIENTIFIC SERVICES

SILICA CONES AND SOCKETS, SILICA TUBING, POLISHED SILICA DISCS AND GLAZED SHEET ex-stock from: **Jencons (Scientific) Ltd., Mark Road, Hemel Hempstead, Hertfordshire. Boxmoor 4641.**

SITUATIONS VACANT

ANALYTICAL ASSISTANTS required for shift work in well-equipped quality control Laboratory of well-established Company operating continuous inorganic chemical processes. Experience of colorimetry would be an advantage. Rates of pay are good and a pension scheme is in operation. **Universal Matthey Products Ltd., Stockingswater Lane, Brimsdown, Enfield. Telephone Howard 4066.**

CHEMIST required for chemical factory in the South of England. Very progressive employment concerned with plant control techniques and research. Please state qualifications, salary required and references available, to: **Box No. 3706 Chemical Age.**

SITUATIONS VACANT: continued

CHEMIST required to take charge of works laboratory in YORKSHIRE. Must be capable of supervising laboratory staff and dealing with chemical problems in the works. He should have a good qualification in Chemistry and have had some years' industrial experience, preferably in inorganic analytical chemistry. This position requires an ambitious man with an alert mind. There is a pension scheme. Replies giving details of age, qualifications and experience and quoting Ref. LAL/CA3/31 should be addressed to **The Group Personnel Manager, LAPORTE INDUSTRIES LIMITED, Hanover House, 14 Hanover Square, London, W.1.**

LEWIS BERGER & SONS LIMITED have a vacancy for a Technical Abstractor. Candidates should preferably be aged 25-35 and have had four years experience of scientific abstracting in the field of paint or a related technology. A degree would be useful but is not essential. Please apply in confidence to the Personnel Assistant to the Managing Director, **Lewis Berger & Sons Ltd., Berger House, Berkeley Square, W.1.**

PROCESS ENGINEERS

Qualified Chemical Engineers are required for our Process Group which is responsible for the process design of complete low temperature plants.

Applicants must have had industrial experience, preferably as Process Design Engineers.

Apply **PERSONNEL MANAGER**
AIR PRODUCTS (G.B.) LTD.
49/50 Poland St.,
London, W.1

TECHNICAL WRITER

A new appointment exists on the staff of the Research Director for a Technical Writer to compile and edit copy for publications on the Company's products and operations, including technical handbooks, pamphlets, advertisements, articles for technical and house journals and press releases. Collaboration with Sales and Publicity Departments will be necessary. It is essential that candidates can produce evidence of their ability to write good cogent English and compose suitable "copy" from basic technical information. A qualification in science or technology, and previous experience of technical writing for industry, is desirable.

Applications giving brief details of age, qualifications and experience should be submitted in writing, quoting ref. SKW/C.A. to: **Personnel Manager, Imperial Smelting Corporation Ltd., St. Andrew's Road, Avonmouth.**

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

LECTURER IN DEPARTMENT OF CHEMICAL ENGINEERING

Applications are invited for appointment to the above post. Duties to be assumed on 1st August, 1960, or as soon as possible thereafter.

The salary will be according to the scale £1,230×60—£1,710. A commencing salary above the minimum notch may be paid on the grounds of special qualifications or experience. In addition, the University is at present authorised to pay an annual vacation savings bonus of up to £60 in September each year.

Membership of the University Institutions Provident Fund is compulsory, and membership of the University Staff Medical Aid Fund is compulsory in the case of an officer who is found eligible in terms of the rules.

Intending applicants are advised to obtain a copy of the Information Sheet relating to this vacancy from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

Applications close, in South Africa and London, on **15th June, 1960.**

SITUATIONS VACANT: continued

TRAINING OFFICER (CHEMIST)

required by the United Kingdom Atomic Energy Authority, Production Group, Springfields Works, Salwick, Preston, Lancashire, to be responsible to the Training Manager for assisting in designing and implementing training schemes for staff and industrial grades, lecturing, organising technical tours of the Works and liaison with Technical Colleges. Chemical and Management subjects may be involved.

An honours degree, or equivalent, in Chemistry is required. Teaching experience is desirable but not essential.

Salary: £860 (at age 25) to £1,340 per annum.

Staff Housing Scheme. Contributory Superannuation.

Send postcard for application form, quoting reference SF.40/J.11, to Works Secretary at above address.

Closing date: 23rd May, 1960.

WORK WANTED AND OFFERED

CRUSHING, GRINDING, MIXING and DRYING for the trade.
THE CRACK PULVERISING MILLS LTD.
Plantation House,
Mincing Lane,
London, E.C.2.

Chemical Age Enquiry Service

For fuller details of equipment, apparatus, chemicals etc., in the advertisement or editorial pages of Chemical Age, fill in the coupons below, ONE PER ENQUIRY, and return to us.

Please send further details about.....
.....
.....
mentioned on page.....*of this issue.*
Name..... *Position*.....
Firm.....
Address .....
.....
Chemical Age Enquiry Service.

Please send further details about.....
.....
.....
mentioned on page.....*of this issue.*
Name..... *Position*.....
Firm.....
Address .....
.....
Chemical Age Enquiry Service.

Please send further details about.....
.....
.....
mentioned on page.....*of this issue.*
Name..... *Position*.....
Firm.....
Address .....
.....
Chemical Age Enquiry Service.

★ *Detach this page complete then fold as marked overleaf to use the post-paid reply folder*

CUT ALONG THIS DOTTED LINE

2nd FOLD

Postage will be paid by the Licensee

No Postage Stamp necessary if posted in Great Britain or Northern Ireland

BUSINESS REPLY FOLDER
Licence No. 2501

CHEMICAL AGE
154-160 FLEET STREET
LONDON, E.C.4

3rd FOLD

1st FOLD

Chemical Age

ENQUIRY SERVICE

★

- *This is a special service for readers of*

  CHEMICAL AGE

- *It is designed to give fuller information on equipment, apparatus, chemicals etc., mentioned in this issue—whether in the editorial text or in an advertisement*

- *Cut out the whole of this page, fold as instructed with post-paid address on the outside*

★

Chemical Age
154 Fleet Street, London, E.C.4
Tel.: Fleet Street 3212

Printed in Great Britain by THE PRESS AT COOMBELANDS LTD., Addlestone, Surrey, and published by BENN BROTHERS LTD., at Bouverie House, 154 Fleet Street, E.C.4.
Registered at the General Post Office. Entered as Second Class Matter at the New York U.S.A., Post Office.